18 A. No.

19 Q. And the last time you spoke to the FBI was

20 a year and a half ago?

21 A. It was a while ago.

22 MR. LEOPOLD: Objection. Asked and

23 answered.

24 BY MR. TEIN:

25 Q. And the last time you spoke to the federal

1 prosecutor's office was when?

2 A. I don't know.

3 Q. Did any of the FBI agents tell you that

4 Marie Villafona had spoken with Mr. Leopold?

5 A. No.

6 Q. Did any of the FBI agents tell you that

7 Marie Villafona had spoken with Mr. Herman?

8 A. No.

9 Q. Did any FBI agents tell you that Jeff

10 Sloman spoke with Mr. Herman.

11 A. No.

12 Q. Did any FBI agents tell you that Jeff

13 Sloman spoke with Mr. Leopold?

14 A. No.

15 Q. Do you know whether any of the federal

16 prosecutors allowed Mr. Herman to review a draft

17 indictment?

18 A. I wouldn't know.

19 Q. Do you know if any of the federal

20 prosecutors discussed a draft indictment with Mr. Herman?

21 A. I wouldn't know.

22 Q. Have you ever e-mailed with any FBI agent

23 or any federal prosecutor?
24 A. No.
25 Q. Have you ever text messaged with any FBI

1 agent or any federal prosecutor?
2 A. No.
3 Q. Has the FBI told you about other testimony?
4 A. No.
5 Q. Has the FBI told you about what other girls
6 have said?
7 A. No.
8 Q. Have federal prosecutors told you what
9 other girls have said?
10 A. No.
11 Q. Do you have any way of getting in touch
12 with the FBI if you wanted to get in touch with them?
13 A. No.
14 Q. How about your parents? Do they know how
15 to get in touch with the FBI?
16 A. I don't know.
17 Q. And by your parents, I'm referring to both
18 sets, okay?
19 A. Oh. Well, I'm referring to only my dad,
20 because my mom really doesn't care to know any of this
21 stuff.
22 Q. So the answer would be the same for your
23 mom and Paul?
24 A. Yeah.
25 Q. Have you spoken to a lawyer named Burt

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1 Ocariz about this case?
2 A. No.
3 Q. Do you know who Burt Ocariz is?
4 Let's see if I can refresh your memory.
5 Does it refresh your memory that he's a good friend of
6 Marie Villafona's boyfriend?
7 A. I don't know who Mari Villafona is.
8 Q. Marie Villafona is the lead federal
9 prosecutor that's on the federal part of this case.
10 Okay?
11 A. No.
12 Q. So does it refresh your memory that Ocariz
13 is the good friend of Marie Villafona's boy friend?
14 A. Not at all.
15 Q. Does it refresh your memory that Villafona
16 tried to get Epstein to pay for Ocariz to represent you
17 in the federal case?
18 A. No.
19 Q. Do you know if Detective Recarey has spoken
20 with your father?
21 A. No.
22 Q. Do you know if Detective Recarey has spoken
23 to your stepmother?
24 A. No.
25 Q. How about with amber?

1 A. Yes, I would know, and no, she did not.
2 Q. Let's put up -- let me ask you some
3 questions about the photo that you had posted on your
4 MySpace page before you erased it last week. Okay?

A. Okay.

MR. TEIN: Do you mind if we close the door a second, please.

MR. LEOPOLD: Exhibit number, please.

MR. TEIN: Put up 25-005.

Hold on a second.

MR. LEOPOLD: Don't say anything. She was talking to her counsel.

MR. TEIN: Put up 25-006.

MR. LEOPOLD: Is that 005 right there?

MR. TEIN: Yes.

BY MR. TEIN:

Q. Who took this photo of you in a warehouse simulating being gang-raped by a bunch of --

MR. LEOPOLD: Objection. Mischaracterizes the photograph, and lack of foundation and predicate.

Fully explain if you need to.

THE WITNESS: I will.

First of all. This is not a warehouse. This is in Steven [redacted]'s garage.

Second of all, I'm not being gang-raped. Everyone has their clothing on.

Thirdly, if you look at all the other pictures in this album, I'm drinking -- what's when you're sick you drink it?

BY MR. TEIN:

Q. You can't ask questions of your counsel.

A. All right. I'm drinking like Sprite. I'm

9 note drinking any kind of alcohol, if you would look at
10 my other pictures in that album. You guys picked the
11 possibly worst pictures out of there to present. And it
12 was just a goofy picture. All of these kids like to be
13 goofy. And that's what we were doing.
14 Q. Who's the man on the left of the picture
15 holding his -- holding a beer bottle as if it were a
16 penis towards your mouth?
17 A. Steven [redacted].
18 Q. Who's the man behind you, right up towards
19 your backs side, with you bent over?
20 A. That one?
21 Q. The right side, kissing with his mouth.
22 A. That's Nick [redacted].
23 Q. He's the one grabbing towards the groin
24 area of Steven [redacted]?
25 A. Yes.

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1 Q. And there's three other men in the photo.
2 What are their names? The one on the left with the hat?
3 A. That's Robbie [redacted] (phonetic).
4 Q. Smiling?
5 A. Yes.
6 Q. Who's the one kissing --
7 MR. LEOPOLD: Don't interrupt. Let her
8 finish the record. She's testifying.
9 MR. TEIN: I know you don't like this
10 picture, my friend.
11 MR. LEOPOLD: The picture is fine.
12 BY MR. TEIN:
13 Q. Who's the one with the hat?

14 MR. LEOPOLD: No. Hold on. Stop, [redacted]
15 You have to let the witness finish her
16 answer. She was in the process of explaining and
17 you cut her off.
18 Please finish what you were saying and then
19 Counsel can ask you whatever he wishes after that.
20 THE WITNESS: Okay. This guy --
21 MR. LEOPOLD: Just make it so the record is
22 clear who you're referring to.
23 THE WITNESS: -- on the far left is John
24 [redacted]
25 BY MR. TEIN:

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1 Q. He's the one whose head is near the groin
2 of Steven [redacted], right?
3 A. Yes.
4 Q. And in the middle there's a man smiling.
5 Who's that?
6 A. That's Robbie [redacted]
7 Q. Who's the one in the red hat, kissing?
8 A. Most Brandon [redacted] (phonetic).
9 Q. Let me stop you for a second. Are you
10 done?
11 A. Yes, I'm done.
12 Q. Who is [redacted]?
13 A. My sister's friend. Well, she's a mutual
14 friend, but more my sister's.
15 Q. What is her last name?
16 A. [redacted]
17 Q. Spell that.

18 A. I don't know how to --
19 Q. Have you spoken to her about this case?
20 A. No.
21 Q. Who's Vince?
22 A. My sister's friend. I don't really speak
23 to him at all.
24 Q. What's his last name?
25 A. [redacted]

1 Q. [redacted]?
2 A. [redacted]
3 Q. And have you spoken to Vince about this
4 case?
5 A. No, sir.
6 Q. Have you spoken to [redacted] about this case?
7 A. Not in detail, but yes.
8 MS. BELOHLAVEK: Are we referring to
9 [redacted]?
10 THE WITNESS: Yes.
11 MR. TEIN: Yes.
12 MS. BELOHLAVEK: Okay.
13 BY MR. TEIN:
14 Q. Have you spoken to Justin about this case?
15 A. Justin?
16 Q. Do you have a friend named Justin?
17 A. I do not have a friend named Justin.
18 Q. From freshman year?
19 A. No.
20 Q. How about [redacted]?
21 A. No.
22 Q. Have you spoken to [redacted] about this case?

23 A. No.
24 Q. What's her last name?
25 A. [redacted]. I don't know how to spell it?

1 Q. Is she the person whose house you went to
2 on New Year's this year?
3 A. No. I wasn't at her house on New Year's.
4 Q. Where were you when you took the picture of
5 Can you say blazed? That on your website?
6 A. I wouldn't know or -- wait. We were at a
7 birthday party for some girl's 16th birthday.
8 Q. Were you drinking at that party?
9 A. No. There was no alcohol or anything
10 there.
11 Q. What does "blaze" mean to you?
12 A. It's like -- it just means like messed up.
13 But we weren't, if you look at the picture.
14 Q. Messed up like drunk, right?
15 A. Sure.
16 Q. Who's [redacted]?
17 A. A girl I know like from like two years ago.
18 Q. She's the one you were supposed to be
19 staying with when you went drinking with Nick [redacted]?
20 A. No.
21 Q. What's [redacted]'s last name?
22 A. [redacted].
23 Q. Where does she live?
24 A. I don't know. In Royal Palm.
25 Q. [redacted]?

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A. Uh-huh. I'm guessing.
Q. Do you know her phone number?
A. No, I do not.
Q. Let's look at 25-010.
A. See, I'm drinking --
Q. I'm not asking you about what you're drinking.
Who are the men in this photo who are pretending to gang up on you and stab you with knives? Who are they?
A. Nick [redacted] and Brandon [redacted] (phonetic).
Q. Are they firemen?
A. Are those? Steven [redacted] -- he said the two stabbing with knives. That's why I said that. I don't know. That's Steven [redacted] and John [redacted].
Q. Are these firemen?
A. No. They're all on -- except Steven, they're all on full rights for football.
Q. Go to 025-015?
MR. LEOPOLD: 025- dash?
MR. TEIN: 015.
THE WITNESS: Gosh, that's so long ago.
BY MR. TEIN:
Q. Who took the photo have you licking the penis?

A. My stepmother.
Q. Whose idea -- that was your stepmother's idea?
A. It was in Buca di Beppo, where she works

5 currently and that was before she worked there, and we
6 just thought it would be funny.
7 MR. TEIN: 19-007. Can you enlarge that?
8 BY MR. TEIN:
9 Q. Who took this photo of you simulating you
10 having sex with a man?
11 A. We're not simulating having sex, and
12 it's -- oh, and the person who took it was, I'm pretty
13 sure, Chris, but I know him as [redacted]. I don't know his
14 last name.
15 Q. Go to 19-006, please.
16 Who took this photo of you simulating sex
17 with a man?
18 A. The same person. And we're not simulating
19 having sex, Mr. --
20 Q. Tein.
21 Did you post that on the Internet?
22 A. Actually, this is an old MySpace I never
23 finished and I never like did anything. I just kind of
24 made it and left it.
25 Q. So the answer is yes, you posted this on

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1 MySpace?
2 A. Yup.
3 Q. Go to 25-016. Who took this photo of you
4 simulating sex with a woman?
5 MR. LEOPOLD: Object to the form of the
6 question. Argumentative.
7 THE WITNESS: First off, she's piercing my
8 belly button or repiercing it, and I'm pretty sure

9 it was just like we put up a camera somewhere and
10 put a timer on it. We didn't have anybody take
11 it.
12 BY MR. TEIN:
13 Q. You posted that on your MySpace page?
14 A. Yeah.
15 Q. Go to 25-013. Is that a photo of you?
16 A. Yep.
17 Q. Who's in the photo with you?
18 A. Steven.
19 Q. Steven [redacted]?
20 A. Yep.
21 Q. Is this you coming out of the shower?
22 A. Yes.
23 Q. Are you clothed in this picture?
24 A. Yeah. I have a halter dress on.
25 Q. Where is that picture taken?

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1 A. In Steven's house.
2 Q. Did you post that on the Internet?
3 A. Yes.
4 Q. All right.
5 MR. TEIN: You can take that down.
6 BY MR. TEIN:
7 Q. Now your boy friend is Brett [redacted],
8 correct?
9 A. Yeah.
10 Q. You lie about your age in order to conceal
11 something about your relationship with Brett [redacted];
12 isn't that correct?
13 A. No.

14 Q. Brett's 22 years old, isn't he?
15 A. Yes.
16 Q. And Brett is a firefighter with the Palm
17 Beach Fire Department, right?
18 A. Yup.
19 Q. Does the Palm Beach Fire Department know
20 that your boy friend is dating an underage girl?
21 A. Actually, Mister, it's legal.
22 Q. Well --
23 MR. LEOPOLD: Just answer the question,
24 [redacted].
25 THE WITNESS: Yes.

1 BY MR. TEIN:
2 Q. Did they know two weeks ago that you were
3 dating an underage girl (sic)?
4 A. Yes. I met everybody in there.
5 Q. Did they know your age?
6 A. Yes.
7 Q. Did you lie about your age so that the fire
8 department wouldn't think that Brett is committing a
9 crime by having a sexual relationship with an underage
10 girl?
11 MS. BELOHLAVEK: Objection. Assumes facts
12 not in evidence.
13 BY MR. TEIN:
14 Q. You can answer the question.
15 A. No.
16 Q. Does the Palm Beach Police Department know
17 that Brett is having a sexual relationship with an

18 underage girl?

19 MR. LEOPOLD: Don't guess. Answer if you

20 know.

21 THE WITNESS: Can you repeat the question?

22 BY MR. TEIN:

23 Q. Does the Palm Beach Police Department know

24 that Brett, a member of the Palm Beach Fire Department,

25 is having a sexual relationship with an underage girl?

1 A. I'm guessing no.

2 Q. You lie about your twin sister [redacted] don't

3 you?

4 MR. LEOPOLD: Objection. Argumentative.

5 BY MR. TEIN:

6 Q. Don't you?

7 A. No. I have never lied for or to [redacted].

8 Q. You lie about the fact that she has a s

9 drug habit, right?

10 A. No. I would never accuse my sister of

11 having a drug habit.

12 Q. Do you try to conceal the fact that she has

13 a drug habit?

14 MR. LEOPOLD: Objection. Argumentative.

15 BY MR. TEIN:

16 Q. You can answer the question.

17 A. No. My sister does not have a drug habit.

18 Q. You lied when you went to the crack house

19 in Georgia, didn't you?

20 MR. LEOPOLD: Objection. Argumentative.

21 Lack of foundation, lack of predicate.

22 THE WITNESS: Never -- what did you say?

23 BY MR. TEIN:
24 Q. You lied when you went to the crack house
25 in Georgia, didn't you?

1 MR. LEOPOLD: Objection. Argumentative.
2 Lack of foundation, lack of predicate.
3 BY MR. TEIN:
4 Q. You can answer the question.
5 A. I have never been to a crack house.
6 Q. Who don't you lie to?
7 MR. LEOPOLD: Objection. Argumentative.
8 Don't answer the question.
9 MR. TEIN: Certify it.
10 .....CERTIFIED QUESTION.....
11 BY MR. TEIN:
12 Q. You don't lie to [redacted], do you?
13 MR. LEOPOLD: Objection. Asked and
14 answered.
15 Don't answer the question.
16 BY MR. TEIN:
17 Q. No. You can answer that question.
18 MR. LEOPOLD: No. I just told her not to.
19 You've asked that question about five --
20 MR. TEIN: No, I haven't.
21 MR. LEOPOLD: Don't answer the question.
22 MR. TEIN: I'll certify it.
23 .....CERTIFIED QUESTION.....
24 MR. LEOPOLD: For the record, you have to
25 stop interrupting me because she can't take down

both of us talking at the same time.

BY MR. TEIN:

Q. You tell [redacted] the truth, don't you?

A. Excuse me?

Q. You tell [redacted] the truth, don't you?

A. When it's -- yes, I tell [redacted] the truth.

Q. Who's [redacted]'s drug dealer?

A. My sister does not have a drug dealer. She lives in Georgia with my mother.

Q. Okay. Who is the drug dealer who dropped you and [redacted] off at 5:45 a.m. in 2006, after being out all night, the two of you, using drugs at Palm Beach Country Estates where your father called the police?

A. Mike [redacted]

Q. He's the drug dealer?

A. He is a drug dealer.

Q. Do you remember [redacted] was arrested by the Palm Beach Police Department and taken to the Juvenile Assessment Center that morning?

A. I do remember that.

Q. Now before you massaged Epstein, you were involuntarily admitted into a juvenile educational facility; isn't that right?

A. Did you say involuntarily.

Q. Yes.

A. No. I was willing to go. I -- duly said sure.

Q. And you went there because you were lying so much, no one could control you; isn't that correct?

5 A. Very incorrect.
6 Q. Now you lie to your parents all the time,
7 don't you?
8 A. Incorrect.
9 MR. LEOPOLD: Objection. Argumentative.
10 BY MR. TEIN:
11 Q. Sorry?
12 A. Incorrect.
13 Q. The day you went to Epstein's house you
14 lied to your father about where you were going, isn't
15 that correct?
16 A. Correct.
17 Q. You admitted to the police that you told
18 your father that you were going shopping, didn't you?
19 A. Yes.
20 Q. And that was a lie, wasn't it?
21 A. Yes.
22 Q. And isn't it true that your father has
23 accused you of lying?
24 A. All the time.
25 Q. Didn't your father throw you out of the

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1 house Thanksgiving of this past year because you were
2 lying so much to him?
3 A. Yes, he did kick me out. No, that's not
4 the reasons why.
5 Q. Didn't your father throw your sister [redacted]
6 out of the house, too?
7 A. Yes.
8 Q. And he threw her out of the house the week

after Thanksgivings, right?

A. I don't know the date, but sure.

Q. Sounds about right?

A. Sure.

Q. And the reason he threw her out of the house was because she was lying, too?

MR. LEOPOLD: Objection. Lack of foundation. Calls for speculation.

BY MR. TEIN:

Q. When your counsel coaches you, you say it's correct, right?

A. I've never been coached.

MR. LEOPOLD: Objection.

BY MR. TEIN:

Q. Okay. When your counsel that it was there was lack of foundation, you agree with your counsel, right?

A. I was like saying, Yeah, let's move on, because there was no point to asking that question.

Q. Your father threw [redacted] out of the house because she was lying, correct?

MR. LEOPOLD: Objection. Lack of foundation.

Hold on, [redacted] Let me just make the objection.

Lack of foundation, predicate, calls for speculation.

BY MR. TEIN:

Q. Answer.

A. I'm not my sister. I don't know.

14 Q. I want to know what you know only.
15 A. I don't know.
16 Q. You don't know. That's your answer?
17 A. Yes.
18 Q. Now your parents filed the police report
19 regarding Mr. Epstein, right?
20 A. Yes.
21 Q. Now your parents are also lying, aren't
22 they?
23 A. Yes.
24 MR. LEOPOLD: Just so the record is clear,
25 the father -- because the mother was up north.

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1 MR. TEIN: Don't testify, Counsel.
2 MR. LEOPOLD: So the record is clear, the
3 father -- the mother was --
4 MR. TEIN: Counsel, don't coach and
5 testify, please. That's absolutely improper.
6 MR. LEOPOLD: You just asked the wrong
7 question.
8 MR. TEIN: You can't coach her that way and
9 you well know it.
10 MR. LEOPOLD: For the record, it's the
11 father. He's remarried, I think on his third
12 marriage.
13 MR. TEIN: You cannot -- it's absolutely,
14 totally against the rules and you know it.
15 MR. LEOPOLD: The natural mother lives in
16 Georgia.
17 MR. TEIN: You need to behave yourself,

18 lawyer.

19 MR. LEOPOLD: The natural mother lives in

20 Georgia. The father is here locally.

21 MR. TEIN: Stop coaching. Stop talking.

22 You object. You know the rules. You just

23 lectured me about the rules, Counsel. So why

24 don't you play by the rules. Or only when they

25 fit you? Why don't you grandstand a little more

1 now. Give us a five-minute speech, Mr. Leopold.

2 MR. LEOPOLD: Are you finished, for the

3 record.

4 MR. TEIN: I'm not talking to you. Do what

5 you want.

6 MR. LEOPOLD: Don't say anything yet.

7 BY MR. TEIN:

8 Q. [redacted] your parents --

9 MR. LEOPOLD: Hold it. Don't say anything

10 yet. Let me --

11 BY MR. TEIN:

12 Q. Your parents, who filed the police report

13 are also liars.

14 MR. LEOPOLD: Don't answer the question.

15 We're not going to answer until I make the record.

16 I want to put on the record, now that Counsel

17 appears to be finished with his comments for the

18 record, that the previous question was

19 inappropriate, was intentionally misleading.

20 Now you can ask the question.

21 BY MR. TEIN:

22 Q. Your parents, who filed the police report

23 in this case, are also proven liars, aren't they?
24 MR. LEOPOLD: Same objection.
25 BY MR. TEIN:

1 Q. Aren't your parents liars?
2 MR. LEOPOLD: Calls for speculation. Lack
3 of predicate.
4 MR. TEIN: Stop coaching. You know what
5 that is, Leopold.
6 MR. LEOPOLD: Calls for speculation. Lack
7 of foundation.
8 THE WITNESS: When you say parents, my mom
9 is not, but sure, yeah, my dad has been to jail
10 for lying.
11 BY MR. TEIN:
12 Q. Your dad went to federal prison for two
13 years for lying, right?
14 A. Correct.
15 Q. Did he tell you it was for a financial
16 fraud?
17 A. Yes.
18 Q. For stealing money from some financial
19 institution?
20 A. Correct.
21 Q. And do you think your father is trying to
22 steal your lawsuit money away from you?
23 Don't look to your lawyer for the answer.
24 MR. LEOPOLD: You can answer if you know
25 the answer to it. I have no idea.

1 THE WITNESS: Yeah.
2 BY MR. TEIN:
3 Q. And your father filed a lawsuit, the first
4 lawsuit for fifty million dollars against Mr. Epstein
5 without consulting you, correct?
6 A. Correct.
7 Q. And your father had a lawyer file the first
8 lawsuit on your behalf for fifty million dollars against
9 Mr. Epstein without your knowledge, correct?
10 A. Correct.
11 Q. And you don't trust your father, do you?
12 A. Correct.
13 Q. And you believe he's trying to manipulate
14 you for his own gain, don't you?
15 A. Sort of.
16 Q. Well, you know that your mother filed a
17 statement, an affidavit, saying that you don't trust your
18 father and that you believe he's trying to manipulate you
19 for his own gain; isn't that correct?
20 A. Correct.
21 Q. You agree with that statement, don't you?
22 A. Uh-huh. Yes.
23 Q. Do you trust your stepmother?
24 A. My stepmother, no.
25 Q. You think she's also trying to steal your

1 Epstein lawsuit money away from you, don't you?
2 A. I would like to clarify something. You
3 keep saying my Epstein lawsuit money. I don't have any
4 money, and it's just a lawsuit at the moment. So I just

5 don't trust her.
6 Q. Okay. You think that your stepmother is
7 trying to take advantage of this lawsuit to try to get
8 money from Mr. Epstein that belongs to you, right?
9 A. Yes.
10 Q. Did your stepmother tell you why she was
11 arrested?
12 A. No.
13 Q. Did your stepmother tell you that she's
14 ever been arrested?
15 A. No.
16 Q. Did she tell you she was arrested for
17 fraud?
18 A. Never.
19 Q. Did she tell you that she was fired from
20 [redacted]?
21 A. No.
22 Q. Did she tell you that whe was fired from
23 [redacted] for stealing?
24 A. No.
25 MR. TEIN: Let's take a break.

1 (Thereupon, a recess was taken.)
2 BY MR. TEIN:
3 Q. [redacted] before you met Jeffrey Epstein have
4 you ever had sexual intercourse?
5 A. Yes, yeah.
6 Q. How many times?
7 A. Just a few. Twice.
8 Q. With how many different men?

9 A. Two.
10 Q. How old were they?
11 A. Zack [redacted] being one year older than me,
12 and then the other person was two years older than me.
13 Q. What was his name?
14 A. Ryan [redacted].
15 Q. How old were you when you first had sexual
16 intercourse?
17 A. 14.
18 Q. How many -- before you met Epstein, how
19 many different men had you had any type of sexual
20 activity with?
21 A. Just those two.
22 Q. Are you saying you never kissed a man other
23 than those two?
24 MR. LEOPOLD: Objection to the form of the
25 question.

1 THE WITNESS: Yes, I had kissed people
2 before.
3 BY MR. TEIN:
4 Q. Before you met Epstein, had you ever had
5 oral sex?
6 A. No.
7 Q. Ever in your life, have you exchanged sex
8 for something of value?
9 A. No.
10 MR. TEIN: We're done.
11 THE WITNESS: Oh, okay.
12 MR. LEOPOLD: We'll read.
13 MS. BELOHLAVEK: I don't have any

14 questions. Thank you.
15 MR. LEOPOLD: Before we go off the record,
16 it's my understanding -- Mr. Goldberger can
17 correct the record, but we have stipulated that
18 color copies of the documents that were identified
19 for identification certainly will be attached to
20 the deposition and counsel will be taking the
21 photographs across street so that they can be
22 laser color copied so that we have a copy, and I'm
23 assuming he'll get a copy to the court reporter,
24 too, to attach, actually a certified copy to the
25 deposition.

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1 MR. GOLDBERGER: Done.
2 MR. LEOPOLD: That's if you agree to that.
3 If not, then I want to pull each one out and put
4 exhibit labels on them, which we should do before
5 we leave.
6 MR. GOLDBERGER: We're not going to do
7 either. I'll have copies sent to the court
8 reporter and she can attach them to the
9 deposition.
10 MR. LEOPOLD: So you're not going to agree
11 to what we talked about during the break then.
12 MR. GOLDBERGER: I'm not quite sure what
13 your asking me to do. Let me finish.
14 MR. LEOPOLD: Okay. Sure. That's fine.
15 MR. GOLDBERGER: Okay. If you want me to
16 go over to Ms. Belohlavek's office and make copies
17 and then I'll give those to the court reporter,

18 fine. All I'm saying is that I would avoid that
19 process. I would send copies to the court
20 reporter. But if it will make you happier --
21 MR. LEOPOLD: I'm not?
22 MR. GOLDBERGER: Let me finish.
23 MR. LEOPOLD: I'm not interrupting now.
24 MR. GOLDBERGER: But if it will make you
25 happier if I go over to Ms. Belohlavek's office

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1 and make a copy of those photos that were part of
2 this deposition and then I'll give them to the
3 court reporter, I'll be happy to do it.
4 MR. LEOPOLD: I trust you implicitly,
5 however you with to do it. However, the
6 documents, before they leave this room, need to
7 have an exhibit sticky on them with the
8 appropriate --
9 MR. GOLDBERGER: Want to go get some? We
10 don't have any.
11 MR. LEOPOLD: I will do that. Excuse me.
12 Let me finish the record, please. You can't do
13 that to the court reporter. She's going to stroke
14 out. You can't do that. You have to let me --
15 MR. TEIN: Finish your sentence, Ted. You
16 are the most long-winded lawyer I've ever seen in
17 my life. Finish your sentence.
18 MR. LEOPOLD: Jack, tell him not to raise
19 his voice, please.
20 MR. TEIN: Finish your sentence. Is there
21 going to be a period at the end of the sentence or
22 is it just going to be comma after comma after

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23 comma?

24 Go ahead, lawyer.

25 MR. LEOPOLD: All right. The exhibits, I

1 can't prevent you from taking them, but I will
2 object and I will be bringing it to the court for
3 sanctions. You cannot take the exhibits out of
4 the room without them being marked. I want them
5 marked, because you cannot identify in the record
6 what was used. And with all due respect to
7 Mr. Goldberger, I do not -- the way this
8 deposition is going, I do not want to rely on
9 Counsel from Miami to mark the appropriate
10 exhibits. I will not do that. I cannot prevent
11 you from taking them. But if you do, I will be
12 bringing the matter to the court with appropriate
13 sanctions, because that is improper. That is
14 improper. When you use something in a deposition,
15 they are to be marked. And you have refused to do
16 that throughout for what ever reason.
17 MR. TEIN: You're wrong. Finish your
18 sentence because you're talking about something
19 you have no idea.
20 Every single one is marked, Ted. Every
21 single one is already marked. But you want to
22 argue about everything. Ever single one is
23 already marked. Isn't that silly, Ted?
24 MR. GOLDBERGER: Thirty years of doing this
25 and I have never had an argument over this.

1 MR. TEIN: You've made -- Ted, you are
2 obstructionist, you are a liar. You have lied and
3 misrepresented things, for the record. You are
4 grandstanding.
5 MR. LEOPOLD: You need to back up.
6 MR. TEIN: No, no. I'm going to finish.
7 MR. LEOPOLD: You can finish, but don't
8 hover over me.
9 MR. TEIN: No one is hovering over you.
10 Stop trying to make a lying record.
11 Let me say something else.
12 Don't you dare threaten me with sanctions,
13 after you lied in a letter to my co-counsel about
14 the fact -- be quiet. Be quiet and let me finish.
15 You lied in a letter to my co-counsel,
16 Mr. Leopold, in which you said -- it was a
17 complete and utter lie -- that you were
18 unavailable this morning because you had a
19 hearing. That was a lie. I have never seen each
20 lawyer deign to do something like that.
21 So you will get the ex -- be quiet. Let me
22 finish. You behave.
23 MR. LEOPOLD: Don't point your finger at
24 me.
25 MR. TEIN: Listen. Be quiet and I won't

1 have a need to point it at you.
2 MR. LEOPOLD: Don't point your finger at --
3 MR. TEIN: Mr. Leopold --
4 MR. LEOPOLD: Don't point your finger at

5 me.

6 MR. TEIN: Mr. Leopold, let me finish.

7 MR. LEOPOLD: Don't raise your voice

8 either.

9 MR. TEIN: Mr. Leopold --

10 MR. LEOPOLD: Jack, do you want to take

11 care of this?

12 MR. TEIN: Let me finish my sentence. The

13 exhibits are marked. We are walking out of here.

14 You are someone who misrepresents the

15 record. It is absolutely atrocious what you do.

16 That is not how a lawyer should behave. This

17 deposition is over. You will get your exhibits,

18 Mr. Leopold.

19 MR. GOLDBERGER: I understand what you're

20 saying, Michael, and I understand Ted's position.

21 Just so there's -- we're going to have lots

22 offer issues in this case. We're going to have

23 lots of reasons to disagree.

24 I'm going to take it over now and I'm going

25 to make copies and I'm going to give them to

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1 Ms. Consor. If you want to go find some exhibit

2 labels and put some exhibit labels on it, be my

3 guest. But that's what I'm offering to do.

4 THE WITNESS: Let me say two things,

5 because I am happy to always disagree and with

6 you, I have no problem; we could always do it

7 professionally.

8 I want to say two things so the record is

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9 very clear. Since for whatever reason I have not
10 been able to look at exhibits because they have
11 been refused to have been shown to me --
12 MR. TEIN: That's a lie.
13 MR. LEOPOLD: Jack, if you represent that
14 the documents have the appropriate exhibit numbers
15 or some identifying markings, 25, 30.000, whatever
16 they may be, then you can take them, make copies,
17 send me a copy, make sure the court reporter gets
18 a copy and then send me a bill for my copy, that's
19 fine. I didn't know that they are marked that way
20 because I haven't been able to look at them.
21 MR. GOLDBERGER: They are barcoded and the
22 number that we've made reference to in the
23 deposition coincides with the barcoding.
24 MR. LEOPOLD: That's fine. Eight by eleven
25 color laser copies are fine.

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1 MS. BELOHLAVEK: The State Attorneys Office
2 is not going to charge anybody for color copies I
3 print out.
4 MR. LEOPOLD: That's fine. He's going to
5 take them back to his office .
6 Secondly -- and I will be more than happy
7 to do it, because it sounds like you all know more
8 about it than I, but I'm happy to get affidavits
9 from Mr. Pincus, Judge Stern, everybody else about
10 what happened with this hearing today, because I
11 know very little about it. But my representations
12 are what they are.
13 MR. GOLDBERGER: They stay --

14 MR. LEOPOLD: Let me just finish for the
15 record.
16 Representations or comments about what
17 happened, representation about this hearing this
18 morning, I know very little about it. I --
19 MR. GOLDBERGER: I'll take your word on
20 that.
21 MR. LEOPOLD: No, no, no. I just put it on
22 the record. I will get an affidavit -- I'm
23 assuming it sounds like you need it -- from Mr.
24 Pincus. I have no clue about what happened and
25 why it was canceled. All I was told when I was

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1 out of town yesterday was that the hearing this
2 morning was cancelled.
3 MR. GOLDBERGER: I'll take your word for
4 it.
5 MR. LEOPOLD: If you want an affidavit,
6 I'll get it for you.
7 MR. GOLDBERGER: It's a personal issue for
8 me because I had to disrupt a vacation and if it
9 was done just because it wasn't convenient for
10 you, then I'm offended by that. But if you're
11 telling me that it was planned and it didn't
12 happen, I'll take your word for it.
13 MR. LEOPOLD: I am more than happy to get
14 you an affidavit, because I don't know the reason
15 why it was canceled other than the fact that I'm
16 assuming since my deposition was taken for four
17 hours on Monday for preparation for the hearing

18 today, for whatever reason it was canceled, I am
19 told it is being re-noticed. Why it was canceled
20 I have no idea, but if your co-counsel wishes an
21 affidavit to that effect from Mr. Pincus, I'm more
22 than happy to get it. But I don't know the reason
23 why it was canceled.
24 MR. TEIN: I don't need it. But what I do
25 take issue with is regardless of why it was

1 canceled, you owed us the courtesy of saying, you
2 know what? We can start earlier this morning.
3 MR. LEOPOLD: I owe you nothing.
4 MR. TEIN: I don't care. Don't interrupt
5 me.
6 Because Jack canceled his vacation plans
7 because of you.
8 MR. GOLDBERGER: That's all right, that's
9 all right.
10 MR. TEIN: And you're selfish. And this
11 deposition is over. Good-by Mr. Leopold.
12 MR. GOLDBERGER: You can go off the record.
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1 C E R T I F I C A T E
2 - - -
3
4 The State of Florida,)
5 County of Palm Beach.)
6
7 I hereby certify that I have read the
8 foregoing deposition by me given, and that the statements
9 contained herein are true and correct to the best of my
10 knowledge and belief, with the exception of any
11 corrections or notations made on the errata sheet, if one
12 was executed.
13
14
15 Dated this _____day of_____, 2008.
16
17
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19
20
21 _____
22 [redacted]
23
24
25

DATE: [!MONTH2] DATE2, 2008

TO: [redacted]
X
X
X, Florida X

IN RE: CASENAME
CASE NO.: 2006 CF09454AXX

Please take notice that on Wednesday, the DATE1 of [!MONTH1], 2008, you gave your deposition in the above-referred matter. At that time, you did not waive signature. It is now necessary that you sign your deposition.

^ Please call our office at the below-listed number to schedule an appointment between the hours of 9:00 a.m. and 4:30 p.m., Monday through Friday.

^As a professional courtesy, I am enclosing a condensed copy of your deposition transcript.

^ As previously agreed to, the transcript will be furnished to you through your counsel. Please read the following instructions:

At Page ^ of the transcript, you will find an errata sheet. As you read your deposition, any changes or corrections that you wish to make should be noted on the errata sheet, citing page and line number of said change. DO NOT write on the transcript itself. Once you have read the transcript and noted any changes, be sure to sign and date the errata sheet and return these pages. You need not return the entire transcript.

If you do not read and sign the deposition within a reasonable time, the original, which has already been forwarded to the ordering attorney, may be filed with the Clerk of the Court. If you wish to waive your signature, sign your name in the blank at the bottom of this letter and return it to us.

Very truly yours,

_____
Judith F. Consor, FPR
Consor & Associates Reporting and Transcription
1655 Palm Beach Lakes Boulevard, Suite 500
West Palm Beach, Florida 33401

I do hereby waive my signature:

_____
SAIGE GONZALEZ

cc via transcript: JACK A. GOLDBERGER, Esquire
LANNA BELOHLAVEK, Esquire
MICHAEL R. TEIN, Esquire
file copy

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1 E R R A T A S H E E T

2 IN RE: CASENAME
DEPOSITION OF: [redacted] TAKEN: [!MONTH1]
3 DATE1, 2008
DO NOT WRITE ON TRANSCRIPT - ENTER CHANGES HERE
4 PAGE # LINE # CHANGE REASON
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9 _____

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17 _____

18 _____

19 _____

20 _____

21 Please forward the original signed errata sheet to this office so that copies may be distributed to all parties.

22

23 Under penalty of perjury, I declare that I have read my [!TYPE] and that it is true and correct subject to any changes in form or substance entered here.

24

25 DATE:_____ SIGNATURE OF DEPONENT:_____

136

1 THE STATE OF FLORIDA,)

2 COUNTY OF PALM BEACH.)

3

4

5 I, the undersigned authority, certify that

6 [redacted] personally appeared before me on the DATE1

7 of [!MONTH1], 2008 and was duly sworn.

8

9 WITNESS my hand and official seal this DATE2

10 day of [!MONTH2], 2008.

11

12

13

14 _____
15 Judith F. Consor, FPR
Notary Public - State of Florida
16
17
18
19
20
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1 C E R T I F I C A T E
2
The State Of Florida,)
3 County Of Palm Beach.)
4
5 I, Judith F. Consor, Court Reporter and Notary Public in and for the State of Florida at large, do
6 hereby certify that I was authorized to and did stenographically report the [!TYPE] of [redacted]
7 that a review of the transcript was not requested; and that the foregoing pages, numbered from 1 to ^,
8 inclusive, are a true and correct transcription of my stenographic notes of said [!TYPE].
9
I further certify that said [!TYPE] was
10 taken at the time and place hereinabove set forth and that the taking of said [!TYPE] was commenced and
11 completed as hereinabove set out.
12 I further certify that I am not an attorney or counsel of any of the parties, nor am I a relative or
13 employee of any attorney or counsel of party connected with the action, nor am I financially interested in the
14 action.
15 The foregoing certification of this transcript does not apply to any reproduction of the same by any
16 means unless under the direct control and/or direction of the certifying reporter.
17
DATED this DATE2 day of [!MONTH2], 2008.

18

19

20 _____
Judith F. Consor, Court Reporter
Florida Professional Reporter

21

22

23

24

25

TAB 14

THE STATE OF FLORIDA,)
COUNTY OF PALM BEACH.)

IN RE:

JEFFREY EPSTEIN.

_____/

SWORN STATEMENT OF [redacted]

Friday, March 21, 2008
4:00 p.m. - 4:20 p.m.

250 Australian Avenue South
Suite 1400
West Palm Beach, Florida 33401

Reported By:
Judith F. Consor, FPR
Notary Public, State of Florida
Consor & Associates Reporting and Transcription
West Palm Beach Office
Phone - 561.682.0905

1 APPEARANCES:

2

On behalf of the Defendant:

3 JACK A. GOLDBERGER, ESQ.

ATTERBURY, GOLDBERGER & WEISS

4 250 AUSTRALIAN AVENUE SOUTH

SUITE 1400

5 WEST PALM BEACH, FLORIDA 33401

561.659.8300

6

ALSO PRESENT

7 LILLY ANN SANCHEZ, ESQ.

FOWLER WHITE, ATTORNEYS AT LAW

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1 Statement taken before Judith F. Consor,
2 Court Reporter and Notary Public in and for the State of
3 Florida at Large, in the above cause.
4 - - -
5 Thereupon,
6 [redacted]
7 having been first duly sworn or affirmed, was examined
8 and stated as follows:
9 THE WITNESS: I do.
10 BY MR. GOLDBERGER:
11 Q. Would you state your name for the record,
12 please.
13 A. [redacted]
14 Q. Okay. [redacted] where do you live now?
15 A. Address?
16 Q. Sure.
17 A. [redacted]
18 [redacted]
19 Q. Do you live there alone or do you live with
20 somebody there?
21 A. My father.
22 Q. Very good. And are you working now or not
23 working? Sometimes you work and sometimes you don't?
24 A. When I want to.
25 Q. Okay. And how old are you today?

A. Twenty-one.

Q. Very good.

What we're going to do today is we're going to take what's know as a sworn statement from you. And my court reporter just put you under oath. So all I want you to do is tell the absolute truth today.

A. Right.

Q. I don't want you to color what you're saying in any way. Really, the only thing that will be of any use to anyone is if you just tell the absolute truth.

A. Right.

Q. So those are the instructions, okay?

A. Okay.

Q. All right. And sometimes -- I've been doing this for a lot of years and sometimes I talk like a lawyer too much, and if you don't understand what I'm --

A. That's your job.

Q. I guess. But if you don't understand what I'm saying at some point, just say, "Jack, say it in English," and I'll make it better for you. Okay?

A. Okay.

Q. So tell me how you first met Jeffrey Epstein.

A. [redacted] introduced me to him.

Q. And [redacted] was a friend of yours at the time?

A. Yes.

Q. Okay. And tell me a little bit about the introduction, how [redacted] introduced you to Jeffrey.

A. Well, she told me that I could go over there and give him a massage --

Q. Okay.

A. -- and he'd pay me for it and that he was a respectful guy.

Q. Okay. So let's break that down a little bit.

She told you you could go over there to Jeffrey Epstein's house and give a massage?

A. Right.

Q. When she said go give a massage did she tell you what she meant by that?

A. Just are -- no. Just a massage. She didn't really give me any details.

Q. Okay. Let me ask it to you another way.

A. Okay.

Q. Was there any suggestion that what you were being offered the opportunity to do would be sexual in any way?

A. No.

Q. Okay. So as far as you understood it and as far as what [redacted] told you, you would be going over to Mr. Epstein's house and just giving him a normal therapeutic massage?

A. Right.

Q. Okay. And I assume [redacted] told you you would be paid for it?

A. Yes.

Q. Did she tell you how much you would be paid?

A. Yes. Two hundred.

Q. Okay. When was the first time that you went to Jeffrey Epstein's house? Was it after you spoke to Alex?

A. Yes.

Q. Okay. And the first time that you went to Mr. Epstein's house, that was in response to [redacted] talking to you in person. In other words, she said -- you saw her somewhere, be it at the store that you worked at or around the neighborhood, she said to you in person, "Do you want to go over to Jeffrey Epstein's house?" Right?

A. Uh-huh.

Q. She didn't call you on the telephone and offer you the opportunity?

A. No.

Q. And she didn't e-mail you about that?

A. No.

Q. She didn't send you a text message like you guys do?

A. No.

Q. Okay. She just simply saw you in person one day and said, "Do you want to go over to Mr. Epstein's house and do a massage?"

A. Yes.

Q. And I take it you said okay and you went over there?

A. Yes.

Q. All right. Now at the time that you went over there, you were not yet 18, but you were almost 18?

A. Yes.

Q. You were within a couple of months of being 18 years old?

A. Yes, I do believe so.

Q. Okay. And what did [redacted] tell you about if asked, how old you should tell anyone you were when you went over to his house?

Was that a bad question?

A. Repeat that.

Q. Sure. Okay.

1 Before you went over to Jeffrey's house
2 after you met [redacted] in person, did she tell you if anyone
3 asked you how old you were, how old you were supposed to
4 say you were?
5 A. Yes.
6 Q. What did she tell you?
7 A. Yes. She told me to say that I was 18 if
8 it was asked.
9 Q. She didn't give you a script and say as
10 soon as you walk in the house you're supposed to say,
11 "I'm 18," right?
12 A. No.
13 Q. She just said that if anyone ever asked,
14 you should say that you were 18 years of age.
15 A. Right.
16 Q. And I assume if you were asked, you wanted
17 to be convincing that you were over the age of 18,
18 because you wanted to do the work, right?
19 A. Right.
20 Q. By the way, were you ever asked?
21 A. Eventually.
22 Q. Okay.
23 A. Not the first day, I don't believe.
24 Q. Okay. Was it Jeffrey or someone else that
25 asked you whether you were over the age of 18?

A. It was probably Jeffrey. I don't remember very clearly.

Q. Whoever asked you, though, you clearly said when asked, "I'm 18."

A. Uh-huh.

Q. And you were very believable in saying that you were over 18?

A. Yes.

Q. Okay. Now the first time that you went to Jeffrey's house did you give him a massage that day?

A. Uh-huh.

MS. SANCHEZ: Answer yes or no so the record is clear.

THE WITNESS: Yes. Okay.

(Discussion held off the record.)

BY MR. GOLDBERGER:

Q. Okay. So you go to Jeffrey's house and you meet him and you're going to do a massage that day, right?

A. Yes.

Q. Now were you -- you were not forced to give a massage, correct?

A. No.

Q. You were not forced to do anything that you didn't want to do?

A. Right.

Q. No one coerced you or threatened you in any way?

A. No way.

Q. No one offered you any drugs to do a massage?

A. No.

Q. No one offered you any alcohol to do a message?

A. No.

Q. And prior to going over to Jeffrey's house the first time there was no e-mail message from him?

A. No.

Q. In any way?

A. No way.

Q. There was no text mail message from him?

A. No.

Q. There was no fax from him?

A. No.

Q. Okay. And the same questions: There was no e-mail from anyone that worked for Jeffrey before you went over there?

A. No.

Q. No text messages from anybody?

A. No.

1 Q. The reason you went there is because [redacted]
2 [redacted] told you in person --
3 A. Yes.
4 Q. -- that if you wanted to -- it was all
5 voluntary on your part -- you could go to Jeffrey's house
6 and give him a massage.
7 A. Right.
8 Q. Okay. So did [redacted] tell you what to expect
9 when you went there, as far as keeping your clothes on or
10 taking your clothes off?
11 A. She did say that he may ask me to take my
12 clothes off and that he was very respectful about that
13 and that if I didn't feel comfortable about it that I
14 didn't have to.
15 Q. All right.
16 A. It was no problem. He wouldn't be upset.
17 Q. All right. So [redacted] told you there would be
18 no pressure on you whatsoever?
19 A. Right.
20 Q. You simply did what you wanted to do?
21 A. Yes.
22 Q. And if you didn't want to do something, you
23 were free to say, "No. I don't want to do it"?
24 A. Yes.
25 Q. All right. And in your experiences with

1 Mr. Epstein, by the way, was there ever a time when that
2 didn't play out, when he tried to force you to do
3 something that you didn't want to do?
4 A. He never tried to force me to do anything.
5 Q. If you said no to something, whatever that
6 might be, he would respect that?
7 A. Yes.
8 Q. All right.
9 Now the first time that you went there do
10 you remember whether you gave Jeffrey a massage with your
11 clothes on or your clothes off?
12 A. At the beginning, it was with all my
13 clothes on.
14 Q. Uh-huh.
15 A. But the most that -- I mean I was still in
16 my bra and panties.
17 Q. Okay. The whole time?
18 A. Yes.
19 Q. Right.
20 A. I'm pretty sure, yes.
21 Q. Did you see during that massage -- did he
22 try and touch you in any way during that massage?
23 A. No.
24 Q. Did he use any kind of device on you in any
25 way during that massage?

1 A. No.
2 Q. Do you know -- he was wearing a towel
3 through that massage?
4 A. Yes.
5 Q. Do you know whether he touched himself in
6 any way, his penis or anything like that, during the
7 massage?
8 A. Yeah, like towards the end.
9 Q. Okay. Do you know whether he masturbated?
10 A. Oh, my gosh.
11 Q. If you don't know, you don't know.
12 A. I mean probably, but I don't know. I can't
13 remember exactly. It was so long ago.
14 Q. Okay. There was nothing that you were
15 uncomfortable with in this massage?
16 A. No. Yeah. And like I said, he also, you
17 know, reassured if I wasn't comfortable with anything,
18 then just tell him and --
19 Q. He would stop?
20 A. -- that would be the end of it.
21 Q. Okay. Now after that first time you met at
22 Jeffrey's house, you left. And did there come other
23 times that you went to Jeffrey's house?
24 A. Yes.
25 Q. And how would that occur? How would that

1 happen?

2 A. [redacted] one of his assistants, would call me

3 and ask me if I would like to come over and give a

4 massage, because he would be in town.

5 Q. So would it be primarily [redacted] that would

6 call or would there be others?

7 A. Most of the time.

8 Q. And would it be a message that would be

9 left for you or would it be you would talk to [redacted] or one

10 of the other as assistants directly?

11 A. I mean generally it would be directly.

12 Q. Okay.

13 A. Unless I didn't answer my phone.

14 Q. And if I think I understand what you're

15 saying, you would talk to Sara or another assistant and

16 they would say, "Listen, Jeffrey's going to be in town.

17 Would you like to come over and give a massage?" Right?

18 A. Yes.

19 Q. Was there ever any suggestion in any of

20 those phone calls where you made arrangements to go to

21 Jeffrey's house that there would be anything sexual that

22 would occur at the house?

23 A. No.

24 Q. Was it always if there was a phone call,

25 that this was whether you wanted to come and give a

1 massage or not?

2 A. Yes, it was always that.

3 Q. Okay. And there was never any discussion,

4 "Well, we really want you to come over because we want

5 you to have sex with Jeffrey," or anything like that?

6 A. Right. No way.

7 Q. Never, ever suggested, right?

8 A. No.

9 Q. Okay. The only thing that ever occurred on

10 any of these phone calls was, "Are you willing to come

11 over," or, "Would you like to come over and give a

12 massage?"

13 A. Right.

14 Q. Okay. And the phone calls from Jeffrey --

15 well, you never spoke to Jeffrey on the phone, right?

16 A. No.

17 Q. Okay. The phone call from [redacted] or any

18 other assistant would always -- it would be sporadic,

19 right? They always said, "Jeffrey's going to be in town.

20 Do you want to come over this afternoon at four o'clock?"

21 A. Yeah, yeah. It wasn't --

22 Q. There was nothing regular about it?

23 A. No.

24 Q. Okay. Other than [redacted] who else would have

25 called you to ask whether you wanted to come over and

give a massage?

A. If it wasn't [redacted] then I believe [redacted] maybe one other person I don't know the name of. Just -- I mean it was mostly [redacted] And [redacted] I spoke to a time or two.

Q. Okay. Now when you would go over to Jeffrey's house after getting a phone call, you would go and you'd go to give him a massage, right?

A. Yes.

Q. And occasionally would there be more than a massage that occurred?

A. It happened a few times.

Q. Okay. And the few times that it happened, though, it was very sporadic and it was nothing that was planned?

A. No way.

Q. It just occurred?

A. Right.

Q. So it wasn't like there was a phone call, you know, "Today we want you to come over and do more than just a massage with Jeffrey"?

A. Right.

Q. When anything more occurred you'd be over there and it would be totally voluntary on your part?

A. Yes; definitely consensual.

Q. Okay. Now when we're talking about more than just a massage, what sort of conduct are we talking about that might have occurred?

A. It was probably mostly -- maybe not, not particularly oral, but, I mean there's just random things, but not sex.

Q. Okay. So let's put it into perspective. You certainly never had intercourse with him, right?

A. No.

Q. And did you actually ever really have oral sex with him?

A. Maybe once or twice. I barely even remember that.

Q. Okay.

A. I mean it was all just mostly --

Q. I'm sorry. Mostly what?

A. Mostly like hand oriented.

Q. Okay. So on occasion you would touch his penis with your hand?

A. It's happened a few times.

Q. Okay. And anytime that occurred it would be totally voluntary on your part?

A. Yes.

Q. Consensual on your part?

A. Yes. He would never make me do anything

Q. And it would just be totally random and it would occur during the moment?

A. Uh-huh.

Q. Okay. There was nothing that was planned in advance concerning that?

A. No.

Q. And it didn't become every time you went over there that would happen, right?

A. Yeah. No.

Q. No, no. I mean just you would go over and give a massage one day and the phone call would be the same, "Do you want to come over and give a massage," and maybe --

A. Yes.

Q. -- maybe another time you would get a phone call, "Do you want to come over and give a massage," and just because of the day it was or whatever was going on, it may have gone a little further where they may have been some touching, correct?

A. Right.

Q. And then the next time you could go over there and it could have been a regular massage again, right?

A. Uh-huh.

Q. Okay. So the point that I guess I'm trying

1 to make was that there were never phone calls that would
2 come to you and they would say, "Do you want to come over
3 and give a massage," and you just assumed it would be to
4 go have sex? That was not the case?
5 A. No.
6 Q. Never, never, never, right?
7 A. Yes.
8 Q. All right. There were times when you would
9 be away and not be in Palm Beach and -- I mean you very
10 much thought that Jeffrey was your friend? You treated
11 him as a friend?
12 A. Yes, definitely. I felt that he was my
13 friend.
14 Q. And there were times when maybe you were
15 out of town and for whatever reason, you found yourself
16 in a situation where you needed some money, correct?
17 A. Yes.
18 Q. Okay. And you felt that the relationship
19 was such that you could call Jeffrey and it never had
20 anything to do with a massage or anything. You would
21 say, "Listen, I could use a couple of dollars. I have a
22 problem."
23 A. Yes.
24 Q. And would he ever hesitate to help you out?
25 A. No.

1 Q. And in fact, did he not tell you that,
2 listen -- he would talk to you about life and about --
3 A. Yes.
4 Q. -- about what you wanted to do with your
5 life?
6 A. Yes.
7 Q. And he said, "If you ever find yourself in
8 trouble, you have a friend in me and you can give me a
9 call"?
10 A. Yes.
11 Q. Okay. If you had to guess -- and
12 recognizing that there can be no accuracy here -- if you
13 had to guess, how many times do you think you went over
14 to Jeffrey's house?
15 A. I would say at least five, less than ten.
16 Q. Okay. I think that's kind of a fair range.
17 And during those five to ten times that you
18 went there, was there ever anything uncomfortable, in
19 your mind, that occurred over at Jeffrey's house?
20 A. No.
21 Q. Okay. I know we've touched on this, but
22 just Lilly, the detail person, makes sure that we get
23 everything. After you met Jeffrey the first time did you
24 ever talk to him on the telephone about arranging a
25 massage or anything like that?

A. No.

Q. Okay. And you never e-mailed him or anything like that?

A. No, no.

Q. Never text-messaged him?

A. No.

Q. Okay. Now at times when you would go over to give a massage, Jeffrey, while he was getting the massage, would be preoccupied doing a lot of things, right?

A. Yes, very often.

Q. He was a busy guy?

A. Yes.

Q. He would be on the telephone talking to folks while you were giving a massage?

A. Yes. Sometimes it would be just a massage and he'd be pretty much doing business the whole time.

Q. Right. Certainly it wasn't sex or anything like that?

A. No.

Q. He would be doing business and you'd be massaging him?

A. Yes.

Q. Okay. Give me one second.

(Discussion held off the record.)

BY MR. GOLDBERGER:

Q. Every time you went back to Jeffrey's house you went back there because you wanted to, right?

A. Uh-huh, yes.

Q. No one -- certainly Mr. Epstein never tried to persuade you or induce you or entice you or coerce you to engage in any kind of sex?

A. No.

Q. And no one representing Jeffrey Epstein ever tried to persuade or induce you to engage in sex?

A. No.

Q. All right. And I think you told me when we first started talking that you were very, very close to your 18th birthday, and when asked, you in fact said you were 18 and tried to be very, very convincing of that.

A. Yeah. I didn't mean that -- all I said was I was 18.

Q. Okay.

A. Like there was no ifs, ands or buts about that.

Q. There was a time when there was a concert or a show down in Fort Lauderdale and Jeffrey got you tickets to go to that show because it was your birthday, right?

A. Correct.

Q. Okay. I assume, based on what you're telling me, Jeffrey didn't know at the time that it was your 18th birthday. He must have --

A. No. It was kind of like -- it was my 19th birthday.

Q. Okay. And you made it pretty clear to him that it was your 19th birthday and not your 18th birthday?

A. Yeah. I tried not to like even touch upon that.

Q. But I know you didn't try and touch upon it --

A. Yes.

Q. -- but was it clear to him, based on what you know, that he thought it was your 19th birthday?

A. Yes.

Q. Okay. Great.

Here's the lawyer talking now.

I didn't try to influence you in any way to say anything, did I?

A. No.

Q. In fact, all I asked you to do is tell me the absolute truth here today?

A. Yes.

Q. And that's what you've done?

A. Yes.

Q. Okay. And you've understood all my questions, have you?

A. Yes.

MR. GOLDBERGER: Okay. I thank you very much for coming in today and it really made it much easier for us to do it this way. So thanks a lot.

(Thereupon, the sworn statement was concluded at 4:20 p.m.)

- - -

1 THE STATE OF FLORIDA,)
2 COUNTY OF PALM BEACH.)
3
4
5 I, the undersigned authority, certify that
6 [redacted] personally appeared before me on the 21 of
7 March, 2008 and was duly sworn.
8
9 WITNESS my hand and official seal this 22nd day
10 of March, 2008.
11
12
13
14 Judith F. Consor
Judith F. Consor, FPR
15 Notary Public - State of Florida
16
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1 C E R T I F I C A T E
2
The State Of Florida,)
3 County Of Palm Beach.)
4
5 I, Judith F. Consor, Court Reporter and Notary Public in and for the State of Florida at large, do
6 hereby certify that I was authorized to and did stenographically report the sworn statement of [redacted]
7 [redacted] that a review of the transcript was requested; and that the foregoing pages, numbered from 1 to 24,
8 inclusive, are a true and correct transcription of my stenographic notes of said sworn statement.
9
I further certify that said sworn statement
10 was taken at the time and place hereinabove set forth and that the taking of said sworn statement was commenced and
11 completed as hereinabove set out.
12 I further certify that I am not an attorney or counsel of any of the parties, nor am I a relative or
13 employee of any attorney or counsel of party connected with the action, nor am I financially interested in the
14 action.
15 The foregoing certification of this transcript does not apply to any reproduction of the same by any
16 means unless under the direct control and/or direction of the certifying reporter.
17
DATED this 22nd day of March, 2007.
18
19
20 Judith F. Consor, Court Reporter
Florida Professional Reporter
21
22
23
24
25

[redacted]

[redacted]

[redacted]

[redacted]

TAB 15

THE STATE OF FLORIDA.)
COUNTY OF PALM BEACH.)

IN RE:

JEFFREY EPSTEIN,

CONTINUED SWORN STATEMENT OF

[redacted]

March 26, 2008
6:05 p.m. to 6:22 p.m.

South 86th Terrace
West Palm Beach, Florida

Reported By:

Maria C. Powers,
Notary Public State of Florida
J. Consor & Associates Reporting & Transcription
West Palm Beach Office
Phone 561.682.0905

ORIGINAL

1 APPEARANCES :

2

3

4 On Behalf of the Defendant:

JACK A. GOLDBERGER, ESQ.

5 ATTERBURY, GOLDBERGER & WEISS

6 250 South Australian Avenue

Suite 1400

7 West Palm Beach, Florida 33401

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I N D E X

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WITNESS: DIRECT

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7 [redacted]

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11 By Mr. Goldberger 4

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1 Sworn Statement taken before Maria Powers,
2 Court Reporter and Notary Public in and for the State
3 of Florida at Large, in the above cause.
4 Thereupon,
5 [redacted]
6 having been first duly sworn, was examined and
7 testified as follows:
8 DIRECT EXAMINATION
9 BY MR. GOLDBERGER:
10 Q [redacted] as you remember, my name is Jack
11 Goldberger. I think we met last Friday, actually.
12 You voluntarily came in and gave a sworn
13 statement to me concerning your knowledge and your
14 friendship with Jeffrey Epstein.
15 I would like to very, very, briefly continue
16 that statement today, and just focus on one area that
17 we forgot to question you about last Friday.
18 A Yes.
19 Q All I want you to tell me is the absolute
20 truth here this evening. There's no right answer,
21 other than the truth, okay?
22 A Right.
23 Q I haven't promised you or asked you to do
24 anything, one way or the other, have I?
25 A No.

Q So, we covered a lot of ground last time.

One area that I didn't ask you about is contact that you've had with either the FBI or the U.S. Attorney's Office, within the last two or three years.

Can you guess or estimate how many times someone from the FBI or the U.S. Attorney's Office or some other law enforcement agency, has attempted to contact you in the last couple of years?

A I'd have to say -- well, maybe five or six meetings with, and more than that with phone contact.

Q Let's try to break it down by meetings and phone contacts. I think that would be the best way to do it.

Of the actual meetings that you've had with someone from law enforcement or from the U.S. Attorney's Office, who do you remember being present at those meetings?

A Nesbith was at all of them.

Q When we're talking about "Nesbith" we're talking about an FBI agent by the name of "Nesbith Kurkendall"?

A Yes.

Q And Nesbith was present at all those meetings?

A Yes.

Q Okay, go ahead.

A The first one was a guy, I'm not sure of his name. And then there's another one that had -- another lady with the victim's rights.

Q She was victim's right representative?

A Yes.

Q We talked about a lawyer by the name "Marie Villafona;" do you know whether she was present during any of those meetings?

A I'm not sure of the name.

Q The first time that you met with Nesbith, where did that take place?

A Here, in my backyard.

Q In your backyard, at your home in Western Palm Beach County, right?

A Yes.

Q Did she announce to you that she was coming, or did she just show up?

A She showed up.

Q Unannounced?

A Yes.

Q During that time, I assume that you told her about your relationship with Jeffrey Epstein and any contact you've had with him, correct?

A Correct.

1 Q Did she tell you anything about whether you
2 were a victim in this case, or anything like that, at
3 that meeting?
4 A Yes, she said I was a victim/witness in this,
5 and that there's victim rights that I'm entitled to,
6 which include counseling and whatnot.
7 Q Did you tell her, at that time, that you
8 didn't feel that you were a victim at all, and that
9 anything that you've done with Jeffrey Epstein was
10 totally voluntary?
11 A Yeah, I did tell her that everything was, you
12 know, consensual with everything, and I don't agree
13 with anything that's going on.
14 Q Did she try and pressure you into being a
15 victim in this thing, when you were not a victim?
16 A I wouldn't say that she pressured me, but she
17 tried to be as convincing as possible.
18 Q Maybe the use of the word "pressure" is too
19 strong. But she was trying to change your opinion of
20 what the relationship was with Jeffrey?
21 A Yes, she was trying to make me feel bad about
22 it, in a way, about what was going on.
23 Q And you didn't feel bad about it, you felt
24 everything was okay, but she was trying to make you
25 feel bad, like something wrong had occurred?

A Yeah.
Q How long did that meeting go on for?
A Probably about -- at least an hour.
Q When was the next time that you had contact with Nesbith or someone else from law enforcement?
A I'm not sure, probably a month or later. I mean, she probably called me and let me know that she was going to -- you know, she wanted to meet sometime soon, to deliver the victim's rights papers to me.
Q So there was a time, after you first met, where, despite the fact that you said, I don't consider myself a victim in this, she called you and said, I want to bring you some paperwork that talks about your victim's rights?
A Yes.
Q What was your response to her when she told you that?
A I told her I would meet with her, 'cause she wanted me to meet with the other woman involved. And they gave them to me.
I took them, but I never really told them I needed counseling or anything like that.
Q Where did that meeting take place?
A I believe it was Panera Bread in Wellington.

Q She actually came and sought you out at a restaurant?

A Well, I told her to meet me there.

Q Were you working there or were you just --

A No, I was just there.

Q So she called you and said, I really, really want to see you. And you said, if you want to see me, meet me at Panera Bread?

A Yes.

Q Did you feel if you didn't meet her, she wasn't going to go away, that you had to deal with her?

A Well, I mean, it wasn't particularly that. I knew that she was going to contact me because of this case. Because, whether I want to be involved or not, I have to be.

Q Okay. That's two meetings that I know of. I think you indicated that, if you had to guess, there were maybe a total of five meetings.

Are there other meetings that we haven't talked about that occurred?

A Yeah, but they were very vague. They weren't anything of importance. And, I mean, it was just her -- or of importance to me, anyway.

Q Would she call you and say, listen, I really,

really, want to talk to you about being a victim or --

A It wasn't always directly about being a victim. And, every time we talked, she would always touch upon the fact that if I need any help or so-on-and-so-forth, because I am a victim in this case.

Q I assume, based on what you're telling me, you continued to tell her, I'm not a victim?

A I just let her say what she said. I never got counseling. But she knows from the beginning, and, I continued to reassure her, that I don't feel that way.

Q So, the first time you met with her, when you spent about an hour with her and you went through all your contact with Jeffrey, that's what occurred at that meeting, and she talked to you about being a victim at that meeting?

A Yes.

Q And then there was this second meeting, where she brought a victim's rights person with her, and that took place at Panera Bread, right?

A Yes.

Q And you had the same response, listen, you think I'm a victim. You could give me the information, but I don't need that information, right?

A Right, pretty much.

Q And then there were some other contacts.

Would she call you and want to talk to you about the specific facts about the case? I mean, why would she contact --

A Yeah, I mean, just to re-question me about certain things, because she wasn't sure that the answers were --

Q Were those in-person meetings?

A I mean, a lot of them were on the phone. I mean, it wasn't very often that we would meet.

Q Was there any other time that you did meet?

We talked about two times that you actually did meet, once here at your home and once at Panera Bread.

Were there any other actual meetings, or did the others occur on the phone?

A There were other meetings, but they were, like I said, not really important.

Q Do you remember where they were that they took place?

A They came to my job, I think, two times.

Q When you say "they" --

A Well, it Nesbith the first time, and, the second time, it was the David Copperfield investigators

1 with Nesbith.
2 Q Right.
3 So, the third time that you met with Nesbith,
4 she came to your job, and she wanted to talk to you
5 about more facts of the case?
6 A Ah-huh.
7 Q And, during that meeting, she also talked to
8 you about your rights as a victim again?
9 A Yeah, she always reassured me of my rights as
10 a victim.
11 Q Then there would have been a fourth time
12 we're talking about now, where there were investigators
13 from Washington coming down, concerning David
14 Copperfield, and Nesbith introduced them to you,
15 correct?
16 A Right.
17 Q I take it what you're telling me is that
18 Nesbith seized the opportunity to talk to you again
19 about being a victim, right?
20 A She always kind of comes out as asking if I'm
21 okay, and if everything okay. And if I ever need any
22 kind of help or anything, with -- you know, I could
23 always have help.
24 Q Did you continue to say, listen, I'm fine,
25 there's no issues here?

A I just -- I mean, I was never pushy on it. I just, like I said, she always knows.

I may not tell her every time, but she always knows how I feel about this case.

Q Meaning?

A I don't need anything.

Q Meaning that you made it really clear to her that you didn't need any help?

A Yeah, from the beginning, I was very, very reassuring about how I felt about it. And I wasn't very happy.

Q All right. I understand.

Now, we're about four contacts with Nesbith -- your house, Panera Bread, work, the David Copperfield investigators.

A Yes.

Q Were there any other meetings that we have not spoken about?

A There may have been like one or two. But they're -- I don't even remember. I mean, those are the ones, like, that remember the most.

Q That you really remember, okay.

Now, were there other telephone calls that occurred, where, kind of the same kind of conversation would occur? You know, there's help for you and you'd

say, I'm really not a victim here?

A Like I said, I was, like, okay. You know, she would always continuously tell me. I mean, but every time, it was the same thing.

I mean I was never -- I mean, I was never mean to any of them. I never gave anybody attitude about anything. But, I mean, she knows that. She knows how I feel.

Q I think what I hear you saying is that she knows how you feel, and you made it clear to her from the start, that you were not a victim?

A Yeah, I mean, she pretty much, does it because that's what she has to do. She has to continue to tell me. And, you know, in a way, try to convince me that I am a victim.

I just let her say what's she's going to say, and, then, you know, okay, goodbye.

Q Do you think that's what she was trying to do, is try to convince you to change your attitude as to how you felt?

A In a way, yes.

Q Is there anything else that we need to discuss that we haven't talked about?

A No, I think that's mostly it.

Q I appreciate your courtesies once again for

seeing me one more time, and doing this voluntarily.

And, thanks so much for making yourself available today.

A No problem.

Q That will do it -- actually, one more time.

Brittany, let me say one more time:

Everything you've told me here today is the absolute truth, right?

A Yes.

Q I haven't tried to convince you to say one thing, one way or the other, have I?

A No.

Q All right. That's it. Thank you very much.

(Thereupon, the sworn statement was concluded at 6:22 p.m.)

1 THE STATE OF FLORIDA)
2 COUNTY OF PALM BEACH)
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4
5
6 I, the undersigned authority, certify that
7 [redacted] personally appeared before me on March
8 26, 2008 and was duly sworn.
9
10
11 WITNESS my hand and office seal this 26TH day
12 of MARCH, 2008.
13
14
15
16 Maria C. Powers, Court Reporter
Notary Public - State of Florida
17 My Commission No. DD149010
My Commission Expires: 9/10/10
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1 C E R T I F I C A T E
2
3 The State of Florida)
County Of Palm Beach)
4
5
6 I, MARIA C. POWERS, a Shorthand Reporter, State of Florida at Large, do hereby certify that
7 [redacted] was by me first duly sworn to testify the whole truth; that I was authorized to and did
8 report said deposition in stenotype; and that the foregoing pages, numbered from 1 to 17 inclusive, are a
9 true and correct transcription of my shorthand notes of said deposition.
10
I further certify that said deposition
11 was taken at the time and place hereinabove set forth and that the taking of said proceeding was commenced
12 and completed as hereinabove set out.
13 I further certify that I am not an attorney or counsel of any of the parties, nor am I a
14 relative or employee of any attorney or counsel of party connected with the action, nor am I financially
15 interested in the action.
16 The foregoing certification of this transcript does not apply to any reproduction of the
17 same by any means, unless under the direct control and/or direction of the certifying reporter.
18
IN WITNESS WHEREOF, I have hereunto set
19 my hand this 26TH day of MARCH, 2008.
20
21
22 Maria C. Powers
Maria C. Powers, Notary Public
23 In and for the State of Florida
My Commission No. DD149010
24 My Commission Expires: 9/10
25

[redacted]

[redacted]

[redacted]

TAB 16

U.S. Department of Justice

United States Attorney
Southern District of Florida

500 South Australian Ave., Suite 400
West Palm Beach, FL 33401
(561) 820-8711
Facsimile: (561) 820-8777

November 16, 2006

VIA FACSIMILE
Lilly Ann Sanchez, Esq.
Fowler White Burnett
1395 Brickell Ave Fl 14
Miami Florida 33131-3300

Re: Jeffrey Epstein

Dear Ms. Sanchez:

Thank you for your letter and voicemail. I will plan to direct all correspondence to you unless you provide other instructions. In turn, please direct all future communications with the Office to my attention.

As I mentioned in my voicemail, Mr. Lewis stated that Mr. Epstein is willing to provide documents and information that we deem necessary to the investigation. I would appreciate if you would forward the documents and information listed below to my attention or, if you prefer, to Special Agent E. Nesbitt Kuyrkendall, Federal Bureau of Investigation, 500 South Flagler Drive, Suite 500, West Palm Beach, FL 33404. If you require a grand jury subpoena for any of the items, please let me know.

1. Documentation related to the ownership of the property located at 358 El Brillo Way, Palm Beach, Florida, including the purchase agreement and any mortgages, liens, or other encumbrances.

2. Documentation related to the ownership of Gulfstream Aircraft N909JE, Model G1159B, and Boeing Aircraft N908JE, Model 727-31, including purchase information, lease agreements, liens or other encumbrances, and payments for maintenance and storage.

3. All documents and information provided to the Palm Beach County State Attorney's Office in connection with its investigation of Mr. Epstein.

4. Bank information, account numbers, bank statements and billing statements for any bank accounts and/or credit cards used by Mr. Epstein (or any of his employees) to pay for Mr. Epstein's personal expenses, from January 1, 2004 to the present.

5. Information and billing statements for any "land lines," cellular telephones, Blackberry units, e-mail addresses, webpages, or the like for Mr. Epstein and all of his personal assistants (including but not limited to [redacted] and [redacted]) from January 1, 2004 to the present.

6. The computers, hard drives, CPUs, and any other computer media (including CD-ROMs, DVDs, floppy disks, flash drives, etc.) removed from 358 El Brillo Way, Palm Beach, Florida prior to the execution of the search warrant at that premises in October 2005.

7. All calendars, diaries, and address books kept by Mr. Epstein and all of his personal assistants from January 1, 2004 to the present, including electronic calendars and address books, whether stored on computer, PDA, or cellular telephone.

8. For persons in his employ at any time from January 1, 2004 to the present, employment and/or separation agreements between Mr. Epstein (or his company) and his personal assistants, airplane pilots, personal chefs, and for anyone who worked at 358 El Brillo Way, Palm Beach, Florida.

9. The names and contact information of all persons who performed "massage services" for Mr. Epstein at 358 El Brillo Way, Palm Beach, Florida or at his residences in New Albany, Ohio, Little St. James, U.S.V.I., and New York, NY; and documentation of payments made to or gifts given to any such persons.

10. Wage and earnings statements and other tax documents for all individuals referenced in items (8) and (9), *supra*.

11. Mr. Epstein's tax returns for 2004 and 2005.

12. From January 1, 2004, to the present, flight manifests and passenger lists for travel via Gulfstream Aircraft N909JE, Model G1159B and Boeing Aircraft N908JE, Model 727-31 (to the extent not already provided).

13. Documentation regarding any other interstate or international travel undertaken by Mr. Epstein from January 1, 2004, to the present, including but not limited to airplane tickets, car rental records, and hotel receipts.

After I have a chance to review the documents, I will contact you to set up a time to interview Mr. Epstein.

Thank you for your assistance with this matter, and I look forward to working with you and Mr. Lefcourt.

Sincerely,

R. Alexander Acosta
United States Attorney

By: A. Marie Villafaña
Assistant United States Attorney

TAB 17

FD-448 (Rev. 6-2-97)

FBI FACSIMILE

COVER SHEET

PRECEDENCE

- ☐ Immediate
- ☐ Priority
- ☒ Routine

CLASSIFICATION

- ☐ Top Secret
- ☐ Secret
- ☐ Confidential
- ☐ Sensitive
- ☒ Unclassified

Time Transmitted: _____
Sender's Initials: jrr
Number of Pages: 5
(including cover sheet)

To: William Riley
Name of Office

Date: 06/20/2007

Facsimile Number: 954-905-4922

Attn: _____
Name Room Telephone

From: FBI
Name of Office

Subject: Service of Federal Grand Jury Subpoenas

Special Handling Instructions: _____

Originator's Name: SA Jason Richards Telephone: 561-833-7517

Originator's Facsimile Number: 561-833-7970

Approved: _____

Brief Description of Communication Faxed: Two subpoenas: 1) William Riley and 2) Custodian of Records, Riley Kiraly

WARNING

Information attached to the cover sheet is U.S. Government Property. If you are not the intended recipient of this information, disclosure, reproduction, distribution, or use of this information is prohibited (18,USC, § 641). Please notify the originator or the local FBI Office immediately to arrange for proper disposition.

United States District Court

SOUTHERN DISTRICT OF FLORIDA

TO: Custodian of Records
Riley Kiraly
Commercial Center of Miami
6135 NW 167th Street E-26
Miami, FL 33015

SUBPOENA TO TESTIFY BEFORE GRAND JURY

FGJ 07-103(WPB)/No. OLY-64

SUBPOENA FOR:
[X] PERSON [X] DOCUMENTS OR OBJECT[S]

YOU ARE HEREBY COMMANDED to appear and testify before the Grand Jury of the United States District Court at the place, date and time specified below.

PLACE:	ROOM:
United States District Courthouse 701 Clematis Street West Palm Beach, Florida 33401	Grand Jury Room
	DATE AND TIME: July 10, 2007 1:00 pm*

YOU ARE ALSO COMMANDED to bring with you the following document(s) or object(s):

THE DOCUMENTS AND OBJECTS LISTED ON ATTACHMENT A.

***Please coordinate your compliance with this subpoena and confirm the date, time, and location of your appearance with S/A Nesbitt Kuyrkendall, Federal Bureau of Investigation, Telephone: (561) 822-5946.**

This subpoena shall remain in effect until you are granted leave to depart by the court or by an officer acting on behalf of the court.

CLERK	DATE:
(BY) DEPUTY CLERK	June 18, 2007

This subpoena is issued upon application of the United States of America.

Name, Address and Phone Number of Assistant U.S. Attorney
Ann Marie C. Villafaña, Assistant U.S. Attorney
500 So. Australian Avenue, Suite 400
West Palm Beach, FL 33401-6235
Tel: (561) 820-8711 x3047
Fax: (561) 802-1787

*If not applicable, enter "none."

To be used in lieu of AO110

FORM ORD-227
JAN.86

ATTACHMENT A
SUBPOENA TO PAUL A. LAVERY

1. All computer equipment and electronic storage media removed from the residence located at 358 El Brillo Way, Palm Beach, Florida, including but not limited to central processing units ("CPUs"), laptop computers, keyboards, printers, modems, routers, hard drives, flash drives, thumb drives, CD-Roms, DVDs, floppy diskettes, digital cameras, and memory cards.

2. All computer equipment and electronic storage media that currently belongs to, or has ever belonged to, Jeffrey Epstein, including but not limited to central processing units ("CPUs"), laptop computers, keyboards, printers, modems, routers, hard drives, flash drives, thumb drives, CD-Roms, DVDs, floppy diskettes, digital cameras, and memory cards.

3. All documents and information related to the nature of the relationship between Mr. William Riley and/or Riley Kiraly and Mr. Jeffrey Epstein, including, but not limited to, retainer agreements; employment agreements; billing statements (whether submitted directly to Mr. Epstein or to a third party for reimbursement); records of the dates when services were performed and the hours worked; telephone logs or records of dates of communications with Mr. Epstein (or with a third party on Mr. Epstein's behalf); appointment calendars/datebooks and the like (whether in hard copy or electronic form) for any period when work was performed on behalf of Mr. Epstein or when any communication was had with Mr. Epstein (or with a third party on Mr. Epstein's behalf); and records of fee arrangements and payments received for work performed on Mr. Epstein's behalf.

United States District Court

SOUTHERN DISTRICT OF FLORIDA

TO: William Riley
Riley Kiraly
Commercial Center of Miami
6135 NW 167th Street E-26
Miami, FL 33015

SUBPOENA TO TESTIFY BEFORE GRAND JURY
FGJ 07-103(WPB)/No. OLY-63

SUBPOENA FOR:
[X] PERSON [X] DOCUMENTS OR OBJECT[S]

YOU ARE HEREBY COMMANDED to appear and testify before the Grand Jury of the United States District Court at the place, date and time specified below.

PLACE:	ROOM:
United States District Courthouse 701 Clematis Street West Palm Beach, Florida 33401	Grand Jury Room
	DATE AND TIME: July 10, 2007 1:00 pm*

YOU ARE ALSO COMMANDED to bring with you the following document(s) or object(s):

THE DOCUMENTS AND OBJECTS LISTED ON ATTACHMENT A.

***Please coordinate your compliance with this subpoena and confirm the date, time, and location of your appearance with S/A Nesbitt Kuyrkendall, Federal Bureau of Investigation, Telephone: (561) 822-5946.**

This subpoena shall remain in effect until you are granted leave to depart by the court or by an officer acting on behalf of the court.

CLERK	DATE:
(BY) DEPUTY CLERK	June 18, 2007

This subpoena is issued upon application of the United States of America

A. Villafaña

Name, Address and Phone Number of Assistant U.S. Attorney
Ann Marie C. Villafaña, Assistant U.S. Attorney
500 So. Australian Avenue, Suite 400
West Palm Beach, FL 33401-6235
Tel: (561) 820-8711 x3047
Fax: (561) 802-1787

*If not applicable, enter "none."

To be used in lieu of AO110

FORM ORD-227
JAN.86

ATTACHMENT A
SUBPOENA TO PAUL A. LAVERY

1. All computer equipment and electronic storage media removed from the residence located at 358 El Brillo Way, Palm Beach, Florida, including but not limited to central processing units ("CPUs"), laptop computers, keyboards, printers, modems, routers, hard drives, flash drives, thumb drives, CD-Roms, DVDs, floppy diskettes, digital cameras, and memory cards.

2. All computer equipment and electronic storage media that currently belongs to, or has ever belonged to, Jeffrey Epstein, including but not limited to central processing units ("CPUs"), laptop computers, keyboards, printers, modems, routers, hard drives, flash drives, thumb drives, CD-Roms, DVDs, floppy diskettes, digital cameras, and memory cards.

3. All documents and information related to the nature of the relationship between Mr. William Riley and/or Riley Kiraly and Mr. Jeffrey Epstein, including, but not limited to, retainer agreements; employment agreements; billing statements (whether submitted directly to Mr. Epstein or to a third party for reimbursement); records of the dates when services were performed and the hours worked; telephone logs or records of dates of communications with Mr. Epstein (or with a third party on Mr. Epstein's behalf); appointment calendars/datebooks and the like (whether in hard copy or electronic form) for any period when work was performed on behalf of Mr. Epstein or when any communication was had with Mr. Epstein (or with a third party on Mr. Epstein's behalf); and records of fee arrangements and payments received for work performed on Mr. Epstein's behalf.

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TAB 18

U.S. Department of Justice

United States Attorney
Southern District of Florida

500 S. Australian Ave, Ste 400
West Palm Beach, FL 33401
(561) 820-8711
Facsimile: (561) 820-8777

December 13, 2007

DELIVERY BY ELECTRONIC MAIL
Jay P. Lefkowitz, Esq.
Kirkland & Ellis LLP
Citigroup Center
153 East 53rd Street
New York, New York 10022-4675

Re: Jeffrey Epstein

Dear Jay:

I am writing not to respond to your asserted "policy concerns" regarding Mr. Epstein's Non-Prosecution Agreement, which will be addressed by the United States Attorney, but the time has come for me to respond to the ever-increasing attacks on my role in the investigation and negotiations.

It is an understatement to say that I am surprised by your allegations regarding my role because I thought that we had worked very well together in resolving this dispute. I also am surprised because I feel that I bent over backwards to keep in mind the effect that the agreement would have on Mr. Epstein and to make sure that you (and he) understood the repercussions of the agreement. For example, I brought to your attention that one potential plea could result in no gain time for your client; I corrected one of your calculations of the Sentencing Guidelines that would have resulted in Mr. Epstein spending far more time in prison than you projected; I contacted the Bureau of Prisons to see whether Mr. Epstein would be eligible for the prison camp that you desired; and I told you my suspicions about the source of the press "leak" and suggested ways to avoid the press. Importantly, I continued to work with you in a professional manner even after I learned that you had been proceeding in bad faith for several weeks – thinking that I had incorrectly concluded that solicitation of minors to engage in prostitution was a registrable offense and that you would "fool" our Office into letting Mr. Epstein plead to a non-registrable offense. Even now, when it is clear that neither you nor your client ever intended to abide by the terms of the agreement that he signed, I have never alleged misconduct on your part.

The first allegation that you raise is that I "assiduously" hid from you the fact that Bert Ocariz is a friend of my boyfriend and that I have a "longstanding relationship" with Mr. Ocariz.

I informed you that I selected Mr. Ocariz because he was a friend and classmate of two people whom I respected, and that I had never met or spoken with Mr. Ocariz prior to contacting him about this case. All of those facts are true. I still have never met Mr. Ocariz, and, at the time that he and I spoke about this case, he did not know about my relationship with his friend. You suggest that I should have explicitly informed you that one of the referrals came from my "boyfriend" rather than simply a "friend," which is the term I used, but it is not my nature to discuss my personal relationships with opposing counsel. Your attacks on me and on the victims establish why I wanted to find someone whom I could trust with safeguarding the victims' best interests in the face of intense pressure from an unlimited number of highly skilled and well paid attorneys. Mr. Ocariz was that person.

One of your letters suggests a business relationship between Mr. Ocariz and my boyfriend. This is patently untrue and neither my boyfriend nor I would have received any financial benefit from Mr. Ocariz's appointment. Furthermore, after Mr. Ocariz learned more about Mr. Epstein's actions (as described below), he expressed a willingness to handle the case *pro bono*, with no financial benefit even to himself. Furthermore, you were given several other options to choose from, including the Podhurst firm, which was later selected by Judge Davis. You rejected those other options.

You also allege that I improperly disclosed information about the case to Mr. Ocariz. I provided Mr. Ocariz with a bare bones summary of the agreement's terms related to his appointment to help him decide whether the case was something he and his firm would be willing to undertake. I did not provide Mr. Ocariz with facts related to the investigation because they were confidential and instead recommended that he "Google" Mr. Epstein's name for background information. When Mr. Ocariz asked for additional information to assist his firm in addressing conflicts issues, I forwarded those questions to you, and you raised objections for the first time. I did not share any further information about Mr. Epstein or the case. Since Mr. Ocariz had been told that you concurred in his selection, out of professional courtesy, I informed Mr. Ocariz of the Office's decision to use a Special Master to make the selection and told him that the Office had made contact with Judge Davis. We have had no further contact since then and I have never had contact with Judge Davis. I understand from you that Mr. Ocariz contacted Judge Davis. You criticize his decision to do so, yet you feel that you and your co-counsel were entitled to contact Judge Davis to try to "lobby" him to select someone to your liking, despite the fact that the Non-Prosecution Agreement vested the Office with the exclusive right to select the attorney representative.

Another reason for my surprise about your allegations regarding misconduct related to the Section 2255 litigation is your earlier desire to have me perform the role of "facilitator" to convince the victims that the lawyer representative was selected by the Office to represent their interests alone and that the out-of-court settlement of their claims was in their best interests. You now state that doing the same things that you had asked me to do earlier is improper meddling in civil litigation.

Much of your letter reiterates the challenges to Detective Recarey's investigation that have

already been submitted to the Office on several occasions and you suggest that I have kept that information from those who reviewed the proposed indictment package. Contrary to your suggestion, those submissions were attached to and incorporated in the proposed indictment package, so your suggestion that I tried to hide something from the reviewers is false. I also take issue with the duplicity of stating that we must accept as true those parts of the Recarey reports and witness statements that you like and we must accept as false those parts that you do not like. You and your co-counsel also impressed upon me from the beginning the need to undertake an independent investigation. It seems inappropriate now to complain because our independent investigation uncovered facts that are unfavorable to your client.

You complain that I "forced" your client and the State Attorney's Office to proceed on charges that they do not believe in, yet you do not want our Office to inform the State Attorney's Office of facts that support the additional charge nor do you want any of the victims of that charge to contact Ms. Belohlavek or the Court. Ms. Belohlavek's opinion may change if she knows the full scope of your client's actions. You and I spent several weeks trying to identify and put together a plea to federal charges that your client was willing to accept. Yet your letter now accuses me of "manufacturing" charges of obstruction of justice, making obscene phone calls, and violating child privacy laws. When Mr. Lourie told you that those charges would "embarrass the Office," he meant that the Office was unwilling to bend the facts to satisfy Mr. Epstein's desired prison sentence – a statement with which I agree.

I hope that you understand how your accusations that I imposed "ultimatums" and "forced" you and your client to agree to unconscionable contract terms cannot square with the true facts of this case. As explained in letters from Messrs. Acosta and Sloman, the indictment was postponed for more than five months to allow you and Mr. Epstein's other attorneys to make presentations to the Office to convince the Office not to prosecute. Those presentations were unsuccessful. As you mention in your letter, I –a simple line AUSA – handled the primary negotiations for the Office, and conducted those negotiations with you, Ms. Sanchez, Mr. Lewis, and a host of other highly skilled and experienced practitioners. As you put it, your group has a "combined 250 years experience" to my fourteen. The agreement itself was signed by Mr. Epstein, Ms. Sanchez, and Mr. Lefcourt, whose experience speaks for itself. You and I spent hours negotiating the terms, including when to use "a" versus "the" and other minutiae. When you and I could not reach agreement, you repeatedly went over my head, involving Messrs. Lourie, Menchel, Sloman, and Acosta in the negotiations at various times. In any and all plea negotiations the defendant understands that his options are to plead or to continue with the investigation and proceed to trial. Those were the same options that were proposed to Mr. Epstein, and they are not "persecution or intimidation tactics." Mr. Epstein chose to sign the agreement with the advice of a multitude of extremely noteworthy counsel.

You also make much of the fact that the names of the victims were not released to Mr. Epstein prior to signing the Agreement. You never asked for such a term. During an earlier meeting, where Mr. Black was present, he raised the concern that you now voice. Mr. Black and I did not have a chance to discuss the issue, but I had already conceived of a way to resolve that

issue if it were raised during negotiations. As I stated, it was not, leading me to believe that it was not a matter of concern to the defense. Since the signing of the Non-Prosecution Agreement, the agents and I have vetted the list of victims more than once. In one instance, we decided to remove a name because, although the minor victim was touched inappropriately by Mr. Epstein, we decided that the link to a payment was insufficient to call it "prostitution." I have always remained open to a challenge to the list, so your suggestion that Mr. Epstein was forced to write a blank check is simply unfounded.

Your last set of allegations relates to the investigation of the matter. For instance, you claim that some of the victims were informed of their right to collect damages prior to a thorough investigation of their allegations against Mr. Epstein. This also is false. None of the victims was informed of the right to sue under Section 2255 prior to the investigation of the claims. Three victims were notified shortly after the signing of the Non-Prosecution Agreement of the general terms of that Agreement. You raised objections to any victim notification, and no further notifications were done. Throughout this process you have seen that I have prepared this case as though it would proceed to trial. Notifying the witnesses of the possibility of damages claims prior to concluding the matter by plea or trial would only undermine my case. If my reassurances are insufficient, the fact that not a single victim has threatened to sue Mr. Epstein should assure you of the integrity of the investigation.[1]

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[1]There are numerous other unfounded allegations in your letter about document demands, the money laundering investigation, contacting potential witnesses, speaking with the press, and the like. For the most part, these allegations have been raised and disproven earlier and need not be readdressed. However, with respect to the subpoena served upon the private investigator, contrary to your assertion, and as your co-counsel has already been told, I did consult with the Justice Department prior to issuing the subpoena and I was told that because I was not subpoenaing an attorney's office or an office physically located within an attorney's office, and because the business did private investigation work for individuals (rather than working exclusively for Mr. Black), I could issue a grand jury subpoena in the normal course, which is what I did. I also did not "threaten" the State Attorney's Office with a grand jury subpoena, as the correspondence with their grand jury coordinator makes perfectly clear.

With regard to your allegation of my filing the Palm Beach Police Department's probable cause affidavit "with the court knowing that the public could access it," I do not know to what you are referring. All documents related to the grand jury investigation have been filed under seal, and the Palm Beach Police Department's probable cause affidavit has never been filed with the Court. If, in fact, you are referring to the *Ex Parte* Declaration of Joseph Recarey that was filed in response to the motion to quash the grand jury subpoena, it was filed both under seal and *ex parte*, so no one should have access to it except the Court and myself. Those documents are still in the Court file only because you have violated one of the terms of the Agreement by failing to "withdraw [Epstein's] pending motion to intervene and to quash certain grand jury subpoenas."

With respect to Ms. Miller, I contacted her attorney – who was paid for by Mr. Epstein and was directed by counsel for Mr. Epstein to demand immunity – and asked only whether he still represented Ms. Miller and if he wanted me to send the victim notification letter to him. He asked what the letter would say and I told him that the letter would be forthcoming in about a week and that I could not provide him with the terms. With respect to Ms. Miller's status as a victim, you again want us to accept as true only facts that are beneficial to your client and to reject as false anything detrimental to him. Ms. Miller made a number of statements that are contradicted by documentary evidence and a review of her recorded statement shows her lack of credibility with respect to a number of statements. Based upon all of the evidence collected, Ms. Miller is classified as a victim as defined by statute. Of course, that does not mean that Ms. Miller considers herself a victim or that she would seek damages from Mr. Epstein. I believe that a number of the identified victims will not seek damages, but that does not negate their legal status as victims.

I hope that you now understand that your accusations against myself and the agents are unfounded. In the future, I recommend that you address your accusations to me so that I can correct any misunderstandings before you make false allegations to others in the Department. I hope that we can move forward with a professional resolution of this matter, whether that be by your client's adherence to the contract that he signed, or by virtue of a trial.

Sincerely,

R. Alexander Acosta
United States Attorney

By: s/*A. Marie Villafaña*
A. Marie Villafaña
Assistant United States Attorney

cc: R. Alexander Acosta, U.S. Attorney
Jeffrey Sloman, First Assistant U.S. Attorney

You also accuse me of "broaden[ing] the scope of the investigation without any foundation for doing so by adding charges of money laundering and violations of a money transmitting business to the investigation." Again, I consulted with the Justice Department's Money Laundering Section about my analysis before expanding that scope. The duty attorney agreed with my analysis.

TAB 19

AO110 (Rev. 04/07) Subpoena to Testify Before Grand Jury

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF FLORIDA

TO:

[redacted]

SUBPOENA TO TESTIFY BEFORE GRAND JURY

FGJ 07-103 (WPB)-Tues. No. OLY-85/1

SUBPOENA FOR:

☑ PERSON ☑ DOCUMENT(S) OR OBJECT(S)

YOU ARE HEREBY COMMANDED to appear and testify before the Grand Jury of the United States District Court at the place, date, and time specified below.

PLACE	COURTROOM
United States District Court 701 Clematis Street West Palm Beach, Florida 33401	Grand Jury Room
	DATE AND TIME 7/1/2008 10:30 am

YOU ARE ALSO COMMANDED to bring with you the following document(s) or object(s):*

ALL DOCUMENTS AND INFORMATION REFERENCED IN THE ATTACHMENT TO THIS SUBPOENA.

☐ *Please see additional information on rev...*

This subpoena shall remain in effect until you are granted leave to depart by the court or by an officer acting on behalf of the court.

CLERK

(By) Deputy Clerk

U.S. COURTS SOUTHERN DISTRICT OF FLORIDA

This subpoena is issued on application of the United States of America.

NAME, ADDRESS AND PHONE NUMBER OF ASSISTANT U.S. ATTORNEY
Ann Marie C. Villafaña, Assistant U.S. Attorney
500 South Australian Avenue, Suite 400
West Palm Beach, Florida 33401-6235
Tel: (561) 820-8711, ext 3047

* If not applicable, enter "none".

ATTACHMENT TO GRAND JURY SUBPOENA OLY-85/1
ADDRESSED TO [redacted]

PLEASE BRING THE FOLLOWING DOCUMENTS, ITEMS, AND INFORMATION WITH YOU TO YOUR GRAND JURY APPEARANCE:

1. Any and all notes, letters, cards, gifts, payments, photographs, or other items that you have received from Jeffrey Epstein, [redacted], [redacted], [redacted], [redacted] Lesley Groff, Ghislaine Maxwell, and/or any other employee or associate of Jeffrey Epstein.

2. Any and all photographs, whether printed or digital, of Jeffrey Epstein, [redacted], [redacted], [redacted], [redacted], Lesley Groff, Ghislaine Maxwell, and/or any other employee or associate of Jeffrey Epstein.

3. Any and all e-mails, instant messages, chats, text messages, voicemails, or telephone messages that you have sent to and/or received from Jeffrey Epstein, [redacted], [redacted], [redacted], [redacted], Lesley Groff, Ghislaine Maxwell, and/or any other employee or associate of Jeffrey Epstein.

4. A list of all telephone numbers (cellular and "land line"), e-mail addresses, screen names, addresses, and any other contact information that you have for the following persons during the period of January 1, 2003 to the present:

a. yourself;
b. Jeffrey Epstein;
c. [redacted]
d.
e.
f.
g. Lesley Groff;
h. Ghislaine Maxwell;
i. any person(s) who introduced you to Jeffrey Epstein and/or Ghislaine Maxwell;
j. any person(s) whom you introduced to Jeffrey Epstein and/or Ghislaine Maxwell;
k. any person(s) who communicated with you to arrange appointments to meet with Jeffrey Epstein and/or Ghislaine Maxwell.

5. Any billing statements for telephone service (cellular and "land line") for any telephone you used during the period of January 1, 2003 to the present.

TAB 20

CONFIDENTIAL PLEA NEGOTIATIONS

TERMS OF EPSTEIN NON-PROSECUTION AGREEMENT

- Epstein pleads guilty (not nolo contendere) to an Information filed by the Palm Beach County State Attorney's Office charging him with:
  (a) lewd and lascivious battery on a child, in violation of Fl. Stat. 800.04(4);
  (b) solicitation of minors to engage in prostitution, in violation of Fl. Stat. 796.03; and
  (c) engaging in sexual activity with minors at least sixteen years of age, in violation of Fl. Stat. 794.05.

- Epstein and the State Attorney's Office make a joint, binding recommendation that Epstein serve at least two years in prison, without any opportunity for withholding adjudication or sentencing; and without probation or community control in lieu of imprisonment.

- Epstein agrees to waive all challenges to the information filed by the State and the right to appeal.

- Epstein agrees that, if any of the victims identified in the federal investigation file suit pursuant to 18 U.S.C. § 2255, Epstein will not contest the jurisdiction of the U.S. District Court for the Southern District of Florida over his person and the subject matter. Epstein will not contest that the identified victims are persons who, while minors, were victims of violations of Title 18, United States Code, Sections(s) 2422 and/or 2423.

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- After Epstein enters his state court plea and is sentenced, the FBI and the U.S. Attorney's Office will close their investigations into violations of 18 U.S.C. §§ 1591, 2422, and 2423.

FEDERAL SENTENCING GUIDELINES CALCULATION
(Using November 1, 2004 Guidelines Manual)

Each count of §§ 1591, 2422(b) and 2423(b):

Base Offense Level under 2G1.3:	24
Offense involved sexual contact:	+2
	26

Counts do not group, so add 5 levels for more than 5 units, pursuant to 3D1.4
Offense Level 31

Apply Repeat and Dangerous Sex Offender against Minors enhancement at 4B1.5
Total Offense Level 36

Assuming Criminal History Category I, advisory guideline range is 188 - 235 months with lifetime supervised release.

TAB 21

IN RE:
INVESTIGATION OF
JEFFREY EPSTEIN
_____/

NON-PROSECUTION AGREEMENT

IT APPEARING that the City of Palm Beach Police Department and the State Attorney's Office for the 15th Judicial Circuit in and for Palm Beach County (hereinafter, the "State Attorney's Office") have conducted an investigation into the conduct of Jeffrey Epstein (hereinafter "Epstein");

IT APPEARING that the State Attorney's Office has charged Epstein by indictment with solicitation of prostitution, in violation of Florida Statutes Section 796.07;

IT APPEARING that the United States Attorney's Office and the Federal Bureau of Investigation have conducted their own investigation into Epstein's background and any offenses that may have been committed by Epstein against the United States from in or around 2001 through in or around September 2007, including:

(1) knowingly and willfully conspiring with others known and unknown to commit an offense against the United States, that is, to use a facility or means of interstate or foreign commerce to knowingly persuade, induce, or entice minor females to engage in prostitution, in violation of Title 18, United States Code, Section 2422(b); all in violation of Title 18, United States Code, Section 371;

(2) knowingly and willfully conspiring with others known and unknown to travel in interstate commerce for the purpose of engaging in illicit sexual conduct, as defined in 18 U.S.C. § 2423(f), with minor females, in violation of Title 18, United States Code, Section 2423(b); all in violation of Title 18, United States Code, Section 2423(e);

(3) using a facility or means of interstate or foreign commerce to knowingly persuade, induce, or entice minor females to engage in prostitution; in violation of Title 18, United States Code, Sections 2422(b) and 2;

(4) traveling in interstate commerce for the purpose of engaging in illicit sexual conduct, as defined in 18 U.S.C. § 2423(f), with minor females; in violation

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of Title 18, United States Code, Section 2423(b); and

(5) knowingly, in and affecting interstate and foreign commerce, recruiting, enticing, and obtaining by any means a person, knowing that the person had not attained the age of 18 years and would be caused to engage in a commercial sex act as defined in 18 U.S.C. § 1591(c)(1); in violation of Title 18, United States Code, Sections 1591(a)(1) and 2; and

IT APPEARING that Epstein seeks to resolve globally his state and federal criminal liability and Epstein understands and acknowledges that, in exchange for the benefits provided by this agreement, he agrees to comply with its terms, including undertaking certain actions with the State Attorney's Office;

IT APPEARING, after an investigation of the offenses and Epstein's background by both State and Federal law enforcement agencies, and after due consultation with the State Attorney's Office, that the interests of the United States, the State of Florida, and the Defendant will be served by the following procedure;

THEREFORE, on the authority of R. Alexander Acosta, United States Attorney for the Southern District of Florida, prosecution in this District for these offenses shall be deferred in favor of prosecution by the State of Florida, provided that Epstein abides by the following conditions and the requirements of this Agreement set forth below.

If the United States Attorney should determine, based on reliable evidence, that, during the period of the Agreement, Epstein willfully violated any of the conditions of this Agreement, then the United States Attorney may, within ninety (90) days following the expiration of the term of home confinement discussed below, provide Epstein with timely notice specifying the condition(s) of the Agreement that he has violated, and shall initiate its prosecution on any offense within sixty (60) days' of giving notice of the violation. Any notice provided to Epstein pursuant to this paragraph shall be provided within 60 days of the United States learning of facts which may provide a basis for a determination of a breach of the Agreement.

After timely fulfilling all the terms and conditions of the Agreement, no prosecution for the offenses set out on pages 1 and 2 of this Agreement, nor any other offenses that have been the subject of the joint investigation by the Federal Bureau of Investigation and the United States Attorney's Office, nor any offenses that arose from the Federal Grand Jury investigation will be instituted in this District, and the charges against Epstein if any, will be dismissed.

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Terms of the Agreement:

1. Epstein shall plead guilty (not nolo contendere) to the Indictment as currently pending against him in the 15th Judicial Circuit in and for Palm Beach County (Case No. 2006-cf-009495AXXXMB) charging one (1) count of solicitation of prostitution, in violation of Fl. Stat. § 796.07. In addition, Epstein shall plead guilty to an Information filed by the State Attorney's Office charging Epstein with an offense that requires him to register as a sex offender, that is, the solicitation of minors to engage in prostitution, in violation of Florida Statutes Section 796.03;

2. Epstein shall make a binding recommendation that the Court impose a thirty (30) month sentence to be divided as follows:

   (a) Epstein shall be sentenced to consecutive terms of twelve (12) months and six (6) months in county jail for all charges, without any opportunity for withholding adjudication or sentencing, and without probation or community control in lieu of imprisonment; and

   (b) Epstein shall be sentenced to a term of twelve (12) months of community control consecutive to his two terms in county jail as described in Term 2(a), *supra*.

3. This agreement is contingent upon a Judge of the 15th Judicial Circuit accepting and executing the sentence agreed upon between the State Attorney's Office and Epstein, the details of which are set forth in this agreement.

4. The terms contained in paragraphs 1 and 2, *supra*, do not foreclose Epstein and the State Attorney's Office from agreeing to recommend any additional charge(s) or any additional term(s) of probation and/or incarceration.

5. Epstein shall waive all challenges to the Information filed by the State Attorney's Office and shall waive the right to appeal his conviction and sentence, except a sentence that exceeds what is set forth in paragraph (2), *supra*.

6. Epstein shall provide to the U.S. Attorney's Office copies of all

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proposed agreements with the State Attorney's Office prior to entering into those agreements.

7. The United States shall provide Epstein's attorneys with a list of individuals whom it has identified as victims, as defined in 18 U.S.C. § 2255, after Epstein has signed this agreement and been sentenced. Upon the execution of this agreement, the United States, in consultation with and subject to the good faith approval of Epstein's counsel, shall select an attorney representative for these persons, who shall be paid for by Epstein. Epstein's counsel may contact the identified individuals through that representative.

8. If any of the individuals referred to in paragraph (7), *supra*, elects to file suit pursuant to 18 U.S.C. § 2255, Epstein will not contest the jurisdiction of the United States District Court for the Southern District of Florida over his person and/or the subject matter, and Epstein waives his right to contest liability and also waives his right to contest damages up to an amount as agreed to between the identified individual and Epstein, so long as the identified individual elects to proceed exclusively under 18 U.S.C. § 2255, and agrees to waive any other claim for damages, whether pursuant to state, federal, or common law. Notwithstanding this waiver, as to those individuals whose names appear on the list provided by the United States, Epstein's signature on this agreement, his waivers and failures to contest liability and such damages in any suit are not to be construed as an admission of any criminal or civil liability.

9. Epstein's signature on this agreement also is not to be construed as an admission of civil or criminal liability or a waiver of any jurisdictional or other defense as to any person whose name does not appear on the list provided by the United States.

10. Except as to those individuals who elect to proceed exclusively under 18 U.S.C. § 2255, as set forth in paragraph (8), *supra*, neither Epstein's signature on this agreement, nor its terms, nor any resulting waivers or settlements by Epstein are to be construed as admissions or evidence of civil or criminal liability or a waiver of any jurisdictional or other defense as to any person, whether or not her name appears on the list provided by the United States.

11. Epstein shall use his best efforts to enter his guilty plea and be

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sentenced not later than October 26, 2007. The United States has no objection to Epstein self-reporting to begin serving his sentence not later than January 4, 2008.

12. Epstein agrees that he will not be afforded any benefits with respect to gain time, other than the rights, opportunities, and benefits as any other inmate, including but not limited to, eligibility for gain time credit based on standard rules and regulations that apply in the State of Florida. At the United States' request, Epstein agrees to provide an accounting of the gain time he earned during his period of incarceration.

13. The parties anticipate that this agreement will not be made part of any public record. If the United States receives a Freedom of Information Act request or any compulsory process commanding the disclosure of the agreement, it will provide notice to Epstein before making that disclosure.

Epstein understands that the United States Attorney has no authority to require the State Attorney's Office to abide by any terms of this agreement. Epstein understands that it is his obligation to undertake discussions with the State Attorney's Office and to use his best efforts to ensure compliance with these procedures, which compliance will be necessary to satisfy the United States' interest. Epstein also understands that it is his obligation to use his best efforts to convince the Judge of the 15th Judicial Circuit to accept Epstein's binding recommendation regarding the sentence to be imposed, and understands that the failure to do so will be a breach of the agreement.

In consideration of Epstein's agreement to plead guilty and to provide compensation in the manner described above, if Epstein successfully fulfills all of the terms and conditions of this agreement, the United States also agrees that it will not institute any criminal charges against any potential co-conspirators of Epstein, including but not limited to [redacted], [redacted], Lesley Groff, or [redacted] Further, upon execution of this agreement and a plea agreement with the State Attorney's Office, the federal Grand Jury investigation will be suspended, and all pending federal Grand Jury subpoenas will be held in abeyance unless and until the defendant violates any term of this agreement. The defendant likewise agrees to withdraw his pending motion to intervene and to quash certain grand jury subpoenas. Both parties agree to maintain their evidence, specifically evidence requested by or directly related to the grand jury subpoenas that have been issued, and including certain computer equipment, inviolate until all of the terms of this agreement have been satisfied. Upon the successful completion of the terms of this agreement, all outstanding grand jury subpoenas shall be deemed withdrawn.

HOUSE_OVERSIGHT_012593

By signing this agreement, Epstein asserts and certifies that each of these terms is material to this agreement and is supported by independent consideration and that a breach of any one of these conditions allows the United States to elect to terminate the agreement and to investigate and prosecute Epstein and any other individual or entity for any and all federal offenses.

By signing this agreement, Epstein asserts and certifies that he is aware of the fact that the Sixth Amendment to the Constitution of the United States provides that in all criminal prosecutions the accused shall enjoy the right to a speedy and public trial. Epstein further is aware that Rule 48(b) of the Federal Rules of Criminal Procedure provides that the Court may dismiss an indictment, information, or complaint for unnecessary delay in presenting a charge to the Grand Jury, filing an information, or in bringing a defendant to trial. Epstein hereby requests that the United States Attorney for the Southern District of Florida defer such prosecution. Epstein agrees and consents that any delay from the date of this Agreement to the date of initiation of prosecution, as provided for in the terms expressed herein, shall be deemed to be a necessary delay at his own request, and he hereby waives any defense to such prosecution on the ground that such delay operated to deny him rights under Rule 48(b) of the Federal Rules of Criminal Procedure and the Sixth Amendment to the Constitution of the United States to a speedy trial or to bar the prosecution by reason of the running of the statute of limitations for a period of months equal to the period between the signing of this agreement and the breach of this agreement as to those offenses that were the subject of the grand jury's investigation. Epstein further asserts and certifies that he understands that the Fifth Amendment and Rule 7(a) of the Federal Rules of Criminal Procedure provide that all felonies must be charged in an indictment presented to a grand jury. Epstein hereby agrees and consents that, if a prosecution against him is instituted for any offense that was the subject of the grand jury's investigation, it may be by way of an Information signed and filed by the United States Attorney, and hereby waives his right to be indicted by a grand jury as to any such offense.

///

///

///

HOUSE_OVERSIGHT_012594

By signing this agreement, Epstein asserts and certifies that the above has been read and explained to him. Epstein hereby states that he understands the conditions of this Non-Prosecution Agreement and agrees to comply with them.

R. ALEXANDER ACOSTA
UNITED STATES ATTORNEY

Dated: _____ By: _____
A. MARIE VILLAFAÑA
ASSISTANT U.S. ATTORNEY

Dated: 9/24/07 _____
JEFFREY EPSTEIN

Dated: _____ _____
GERALD LEFCOURT, ESQ.
COUNSEL TO JEFFREY EPSTEIN

Dated: _____ _____
LILLY ANN SANCHEZ, ESQ.
ATTORNEY FOR JEFFREY EPSTEIN

HOUSE_OVERSIGHT_012595

By signing this agreement, Epstein asserts and certifies that the above has been read and explained to him. Epstein hereby states that he understands the conditions of this Non-Prosecution Agreement and agrees to comply with them.

R. ALEXANDER ACOSTA
UNITED STATES ATTORNEY

Dated: _____ By: _____
A. MARIE VILLAFAÑA
ASSISTANT U.S. ATTORNEY

Dated: _____ _____
JEFFREY EPSTEIN

Dated: 9/24/07 _____
GERALD LEFCOURT, ESQ.
COUNSEL TO JEFFREY EPSTEIN

Dated: _____ _____
LILLY ANN SANCHEZ, ESQ.
ATTORNEY FOR JEFFREY EPSTEIN

HOUSE_OVERSIGHT_012596

By signing this agreement, Epstein asserts and certifies that the above has been read and explained to him. Epstein hereby states that he understands the conditions of this Non-Prosecution Agreement and agrees to comply with them.

R. ALEXANDER ACOSTA
UNITED STATES ATTORNEY

Dated: _____ By: _____
A. MARIE VILLAFAÑA
ASSISTANT U.S. ATTORNEY

Dated: _____ _____
JEFFREY EPSTEIN

Dated: _____ _____
GERALD LEFCOURT, ESQ.
COUNSEL TO JEFFREY EPSTEIN

Dated: 9-24-07 _____
LILLY ANN SANCHEZ, ESQ.
ATTORNEY FOR JEFFREY EPSTEIN

HOUSE_OVERSIGHT_012597

TAB 22

U.S. Department of Justice

United States Attorney
Southern District of Florida

500 South Australian Ave., Suite 400
West Palm Beach, FL 33401
(561) 820-8711

August 31, 2007

DELIVERY BY FACSIMILE
Ms. [redacted]
In care of Bruce Lyons, Esq.
Lyons and Sanders
600 Northeast 3rd Avenue
Fort Lauderdale, FL 33304

Re: Grand Jury Investigation--Confidential

Dear [redacted]

This letter is an invitation for you to testify before a federal Grand Jury, and is supplied in order to provide helpful background information about the Grand Jury. The Grand Jury consists of from sixteen to twenty-three persons from the Southern District of Florida. It is their responsibility to inquire into federal crimes which may have been committed in this District.

As a Grand Jury witness you will be asked to testify and answer questions under oath, and to produce records and documents. Only the members of the Grand Jury, attorneys for the United States and a stenographer are permitted in the Grand Jury room while you testify.

The U.S. Department of Justice encourages prosecutors to notify an individual in appropriate cases that he or she is a target of a grand jury investigation. Accordingly, you are hereby notified that you are a target of a federal grand jury investigation in the Southern District of Florida concerning suspected violations of federal law, including but not limited to, possible violations of Title 18, United States Code, Sections 2, 371, 1512, 1591, 1952, 1956, 1960, 2421, 2422, and 2423.

You are advised that the destruction or alteration of any document required to be produced before the grand jury constitutes serious violation of federal law, including but not limited to Obstruction of Justice.

A "target" is a person as to whom the prosecutors or the Grand Jury have substantial

evidence linking him or her to the commission of a crime and who, in the judgment of the prosecutors, is a putative defendant.

This letter constitutes an invitation to you to testify on your own behalf before the grand jury about matters under investigation. Of course, you are not required to appear before the grand jury. The decision whether to do so is a voluntary matter which is entirely up to you. The grand jury, if in fact it learns of this opportunity afforded to you, will be instructed not to draw any adverse inference from your failure to appear should you decide not to accept this invitation. You must further understand that should you decide to testify, your testimony could be used against you if any criminal charges should be filed against you.

Should you decide to appear before the grand jury, you will have the same rights and obligations as any non-immunized grand jury witness. Specifically,

> You may refuse to answer any question if a truthful answer to the question would tend to incriminate you.
>
> You have the right to stop answering questions at any time.
>
> Anything you say may be used against you at the grand jury or in a subsequent legal proceeding.
>
> The grand jury will permit you a reasonable opportunity to step outside the grand jury room to consult with your attorney, if you so desire, at any point during the testimony you give.

Please be further advised that the giving of false testimony before the grand jury will subject you to a prosecution for perjury in addition to the violations set forth above.

As a target of a grand jury investigation who has been asked to appear before the grand jury, you may wish to retain the services of an attorney. If you cannot afford the services of independent counsel, the Court may be able to appoint counsel to represent you. If you would like the United States to ask the Court to appoint an attorney to represent you, please contact the undersigned at 561 209-1047. The United States is investigating other individuals, and you may be interested in cooperating with the United States against those other targets. If you hire an attorney, or if the Court appoints one to represent you, that counsel can contact me to discuss that possibility.

Ms. [redacted]
August 31, 2007
Page 3

Please advise me whether you wish to testify before the grand jury by close of business Wednesday, September 12, 2007. If I do not receive notification from you or your counsel by this date, I will assume that you do not wish to testify before the grand jury.

Sincerely,
R. ALEXANDER ACOSTA
UNITED STATES ATTORNEY

By: A. Marie Villafaña
A. Marie Villafaña
Assistant United States Attorney

TAB 23

U.S. Department of Justice

United States Attorney
Southern District of Florida

500 South Australian Ave., Suite 400
West Palm Beach, FL 33401
(561) 820-8711
Facsimile: (561) 820-8777

August 16, 2007

VIA FACSIMILE
Gerald Lefcourt, Esq.
Gerald P. Lefcourt, P.C.
148 East 78th Street
New York, NY 10021

Re: Subpoena to Custodian of Records, NES, LLC

Dear Mr. Lefcourt:

I write in response to your letter of July 18, 2007 regarding the grand jury subpoena issued to the Custodian of Records for NES, LLC. I have attached an identical subpoena containing a return date of September 11, 2007, and subpoenas for two NES employees, Eric Gany and Harry Beller. If you will not be representing Messrs. Gany and Beller, please let me know.

First, as I mentioned in my earlier correspondence, a properly executed declaration from the Custodian of Records is needed, and, if no documents responsive to a particular request exist, the Custodian should certify that under penalty of perjury.

Second, you write that NES has no documents responsive to Requests 1 through 5. I know that NES has several credit card accounts for the benefit of the persons who manage Mr. Epstein's properties, including Janusz Banasiak and Alfredo Rodriguez. I also know that NES regularly receives money from an account that is used to pay expenses at 358 El Brillo Way and also wires money to that same account. Those wire transfers fall within the time period called for by the subpoena and number in the hundreds of thousands of dollars. If NES does not maintain records of its banking activities, then I would like to see a copy of its document retention policy, so I have added that to the Attachment to the Subpoena.

Third, Mr. Menchel's comment to you about potential money laundering charges related only to a resolution of the case. In other words, if the sex offense case is resolved, the Office would close its investigation into other areas as well. The matter has not been, and it does not appear that it will be, resolved so the money laundering investigation continues, and Request Number 6 will not be withdrawn. The request is not overbroad and is stated with particularity, so please comply with the request by the new deadline.

With respect to paragraph 7, the information provided regarding the pilots came from the corporate records of Hyperion and JEGE, Inc., not NES. However, I have provided a shorter list in the new subpoena attachment.

I also have enclosed another certification for the Custodian of Records' signature.

Thank you again for your assistance.

Sincerely,

R. Alexander Acosta
United States Attorney

By: A. Marie Villafaña
A. Marie Villafaña
Assistant United States Attorney

cc: B. Nesbitt Kuyrkendall, FBI (with enclosures)

United States District Court

SOUTHERN DISTRICT OF FLORIDA

TO: Custodian of Records
NES, LLC

SUBPOENA TO TESTIFY BEFORE GRAND JURY
FGJ 07-103(WPB)/No. OLY-65/2

SUBPOENA FOR:
[X] PERSON [X] DOCUMENTS OR OBJECT[S]

YOU ARE HEREBY COMMANDED to appear and testify before the Grand Jury of the United States District Court at the place, date and time specified below.

PLACE:	ROOM:
United States District Courthouse 701 Clematis Street West Palm Beach, Florida 33401	Grand Jury Room
	DATE AND TIME: September 11, 2007 1:00 pm*

YOU ARE ALSO COMMANDED to bring with you the following document(s) or object(s):

THE DOCUMENTS AND OBJECTS LISTED ON ATTACHMENT A.

***Please coordinate your compliance with this subpoena and confirm the date, time, and location of your appearance with S/A Nesbitt Kuyrkendall, Federal Bureau of Investigation, Telephone: (561) 822-5946.**

This subpoena shall remain in effect until you are granted leave to depart by the court or by an officer acting on behalf of the court.

CLERK	DATE:
(BY) DEPUTY CLERK	August 16, 2007

This subpoena is issued upon application of the United States of America

Ann Marie Villafaña

Name, Address and Phone Number of Assistant U.S. Attorney
Ann Marie C. Villafaña, Assistant U.S. Attorney
500 So. Australian Avenue, Suite 400
West Palm Beach, FL 33401-6235
Tel: (561) 820-8711 x3047
Fax: (561) 802-1787

*If not applicable, enter "none."

To be used in lieu of AO110

FORM ORD-227
JAN.86

ATTACHMENT TO SUBPOENA OLY-65/2
NES, LLC

1. For the period of January 1, 2003 to the present, all calendars, agendas, daily diaries, or other records of appointments, travel, meetings and the like, kept by or on behalf of Jeffrey Epstein, [redacted] [redacted] Lesley Groff, and/or [redacted]. This request includes information that is kept in physical "hard copy" and/or electronic form, whether stored on a personal computer, database server, cellular telephone, "Blackberry" unit, personal digital assistant ("PDA") or other handheld electronic device, or in any other electronic form, and all metadata included within the electronic/physical files.

2. For the period of January 1, 2003 to the present, all address books, contact lists, or other records of names, telephone numbers, addresses, and/or e-mail addresses kept by or on behalf of Jeffrey Epstein, [redacted] [redacted], Lesley Groff, and/or [redacted]. This request includes information that is kept in physical "hard copy" and/or electronic form, whether stored on a personal computer, database server, cellular telephone, "Blackberry" unit, personal digital assistant ("PDA") or other handheld electronic device, or in any other electronic form, and all metadata included within the electronic/physical files.

3. For the period of January 1, 2003 to the present, all e-mails, instant messages, text messages, meeting invitations, and any other electronic communication sent by Jeffrey Epstein, [redacted], [redacted] Lesley Groff, and/or [redacted] to Jeffrey Epstein, [redacted] [redacted] Lesley Groff, and/or [redacted]. This request includes information that is kept in physical "hard copy" and/or electronic form, whether stored on a personal computer, database server, cellular telephone, "Blackberry" unit, personal digital assistant ("PDA") or other handheld electronic device, or in any other electronic form, and all metadata included within the electronic/physical files.

4. For the period of January 1, 2003 to the present, all documents and information referring or relating to the transfer of funds to or from any account owned by NES, LLC to or from any bank account used for the maintenance of the property located at 358 El Brillo Way, Palm Beach, Florida, or for the payment of any person working at 358 El Brillo Way, Palm Beach, Florida.

5. For the period of January 1, 2003 to the present, all documents and information referring or relating to the transfer of funds to or from any account owned by NES, LLC to or from any bank account on which Janusz Banasiak and/or Alfredo Rodriguez had or has check-writing authority and/or access to via debit/ATM card.

6. For the period of January 1, 2003 to the present, all documents and information referring or relating to the transfer of fund to or from any account owned by NES, LLC to or from any account owned by JEGE, Inc., Jeffrey E. Epstein, Hyperion Air, Inc., Financial Trust Co., New York Strategy Group, Inc., J. Epstein Virgin Islands Foundations, Inc., and/or Epstein Interests.

7. For the period of January 1, 2003 to the present, the names of all employees and all corporate directors, board members, and shareholders.

8. For the period of January 1, 2003 to the present, copies of all W-2s and/or 1099s for the following persons: Jeffrey Epstein, [redacted], Lesley Groff, [redacted] Janusz Banasiak, Alfredo Rodriguez, Harry Beller, [redacted], [redacted] and Eric T. Gany.

9. Any and all document retention and/or destruction policies.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

IN RE FEDERAL GRAND JURY SUBPOENA
OLY-65/2
ADDRESSED TO NES, LLC
_____/

CERTIFICATION REGARDING DOMESTIC RECORDS OF REGULARLY CONDUCTED ACTIVITY

I, the undersigned, _____, declare that I am employed by NES, LLC in the position of _____, and, by reason of my position, am authorized and qualified to make this declaration.

1. In my employment with NES, LLC, I am familiar with the business records it maintains.

2. I certify that the records attached to this certification:

   (a) were made at or near the time of the occurrence of the matters set forth therein, by or from information transmitted by, a person with knowledge of those matters;

   (b) were kept in the course of regularly conducted business activity; and

   (c) were made by the regularly conducted activity as a regular practice.

2. Among the records so maintained are the attached records itemized in Appendix A (Document Inventory).

3. I further certify that the documents attached hereto are responsive to Grand Jury Subpoena 65/2 served upon NES, LLC.

4. I further certify that NES, LLC has no documents responsive to request number(s) _____ in Grand Jury Subpoena number 65/2. [Fill in or strike out as appropriate.]

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing information is true and correct.

Executed this _____ day of _____, 2007.

Place of execution: _____

_____
Signature

United States District Court

SOUTHERN DISTRICT OF FLORIDA

TO: HARRY BELLER
NES, LLC

SUBPOENA TO TESTIFY BEFORE GRAND JURY
FGJ 07-103(WPB)/No. OLY-75

SUBPOENA FOR:
[X] PERSON [ ] DOCUMENTS OR OBJECT[S]

YOU ARE HEREBY COMMANDED to appear and testify before the Grand Jury of the United States District Court at the place, date and time specified below.

PLACE:	ROOM:
United States District Courthouse 701 Clematis Street West Palm Beach, Florida 33401	Grand Jury Room
	DATE AND TIME: September 11, 2007 1:00 pm*

YOU ARE ALSO COMMANDED to bring with you the following document(s) or object(s):

***Please coordinate your compliance with this subpoena and confirm the date, time, and location of your appearance with S/A Nesbitt Kuyrkendall, Federal Bureau of Investigation, Telephone: (561) 822-5946.**

This subpoena shall remain in effect until you are granted leave to depart by the court or by an officer acting on behalf of the court.

CLERK	DATE:
(BY) DEPUTY CLERK	August 16, 2007

This subpoena is issued upon application of the United States of America

Name, Address and Phone Number of Assistant U.S. Attorney
Ann Marie C. Villafaña, Assistant U.S. Attorney
500 So. Australian Avenue, Suite 400
West Palm Beach, FL 33401-6235
Tel: (561) 820-8711 x3047
Fax: (561) 802-1787

*If not applicable, enter "none."

To be used in lieu of AO110

FORM ORD-227
JAN.86

United States District Court

SOUTHERN DISTRICT OF FLORIDA

TO: ERIC GANY
NES, LLC

SUBPOENA TO TESTIFY BEFORE GRAND JURY
FGJ 07-103(WPB)/No. OLY-76

SUBPOENA FOR:
[X] PERSON [ ] DOCUMENTS OR OBJECT[S]

YOU ARE HEREBY COMMANDED to appear and testify before the Grand Jury of the United States District Court at the place, date and time specified below.

PLACE:	ROOM:
United States District Courthouse 701 Clematis Street West Palm Beach, Florida 33401	Grand Jury Room
	DATE AND TIME: September 11, 2007 1:00 pm*

YOU ARE ALSO COMMANDED to bring with you the following document(s) or object(s):

***Please coordinate your compliance with this subpoena and confirm the date, time, and location of your appearance with S/A Nesbitt Kuyrkendall, Federal Bureau of Investigation, Telephone: (561) 822-5946.**

This subpoena shall remain in effect until you are granted leave to depart by the court or by an officer acting on behalf of the court.

CLERK	DATE:
(BY) DEPUTY CLERK	August 16, 2007

This subpoena is issued upon application of the United States of America.

Name, Address and Phone Number of Assistant U.S. Attorney
Ann Marie C. Villafaña, Assistant U.S. Attorney
500 So. Australian Avenue, Suite 400
West Palm Beach, FL 33401-6235
Tel: (561) 820-8711 x3047
Fax: (561) 802-1787

*If not applicable, enter "none."

To be used in lieu of AO110

FORM ORD-227
JAN.86

U.S. Department of Justice

United States Attorney
Southern District of Florida

A. Marie Villafaña
500 S. Australian Ave, 4th Floor
West Palm Beach, Florida 33401
(561) 820-8711
Facsimile (561) 820-8777

FACSIMILE COVER SHEET

TO: Gerald Lefcourt, Esq.

DATE: August 16, 2007

FAX NO. 212-988-6192 # OF PAGES: 10

PHONE NO. 212-737-0400 RE: NES, LLC

FROM: A. MARIE VILLAFAÑA, Assistant U.S. Attorney

PHONE NO. 561 209-1047

COMMENTS:

TAB 24

"Villafana, Ann Marie C. \(USAFLS\)" [redacted]

09/19/2007 12:14 PM

To "Jay Lefkowitz" [redacted]
cc
bcc
Subject RE: Meeting

History This message has been replied to

Judge Johnson has duty next week.

Jay – I hate to have to be firm about this, but we need to wrap this up by Monday. I will not miss my indictment date when this has dragged on for several weeks already and then, if things fall apart, be left in a less advantageous position than before the negotiations. I have had an 82-page pros memo and 53-page indictment sitting on the shelf since May to engage in these negotiations. There has to be an ending date, and that date is Monday.

A. Marie Villafaña
Assistant U.S. Attorney
[redacted]

From: Jay Lefkowitz [mailto: [redacted]]
Sent: Wednesday, September 19, 2007 11:58 AM
To: Villafana, Ann Marie C. (USAFLS)
Subject: Re: Meeting

We may want to meet monday and potentially continue to tues if necessary. Which mag is on duty?

----- Original Message -----
From: "Villafana, Ann Marie C. \(USAFLS\)" [redacted]]
Sent: 09/19/2007 11:51 AM AST
To: Jay Lefkowitz
Subject: Meeting

Barry is available Monday morning. Our most flexible West Palm Beach magistrate is on duty on Monday, so, assuming we have signed documents by 1:30 or so, we should be able to get Mr. Epstein arraigned on Monday. I doubt that we will be able to get everything finished up here, get down to Miami, and try to find a Miami mag by close of business on Monday.

A. Marie Villafaña

Assistant U.S. Attorney

[redacted]

****

The information contained in this communication is
confidential, may be attorney-client privileged, may
constitute inside information, and is intended only for
the use of the addressee. It is the property of
Kirkland & Ellis LLP or Kirkland & Ellis International LLP.
Unauthorized use, disclosure or copying of this
communication or any part thereof is strictly prohibited
and may be unlawful. If you have received this
communication in error, please notify us immediately by
return e-mail or by e-mail to postmaster@kirkland.com, and
destroy this communication and all copies thereof,
including all attachments.
****

TAB 25

"Villafana, Ann Marie C. \(USAFLS\)"
[redacted]
09/23/2007 08:04 PM

To "Jay Lefkowitz" [redacted]
cc
bcc
Subject RE: Revised agreement

1 is definitely under 18 still, and I think there is a second minor. The appointment of [redacted] ad litem is to provide you with a mechanism to make contact with the girls and to give them the assistance of an independent attorney who represents them (as opposed to me, who represents the government). If you are willing to provide the girls with independent counsel, at Mr. Epstein's expense (and I get to pick the attorney), that is alright with me.

From: Jay Lefkowitz [mailto:[redacted]
Sent: Sunday, September 23, 2007 6:55 PM
To: Villafana, Ann Marie C. (USAFLS)
Subject: Re: Revised agreement

Will do. [redacted] do you need a guardian ad litem at all? Are any of the 40 under 18 now?

----- Original Message -----
From: "Villafana, Ann Marie C. \(USAFLS\)" [redacted]
Sent: 09/23/2007 06:52 PM AST
To: Jay Lefkowitz
Subject: Revised agreement

Hi Jay - Can you look at this? Especially paragraph 7. I think this covers the exclusive remedy concern you had.

<<070923 Epstein Non-Prosecution Agreement final.pdf>>

****
The information contained in this communication is confidential, may be attorney-client privileged, may constitute inside information, and is intended only for the use of the addressee. It is the property of Kirkland & Ellis LLP or Kirkland & Ellis International LLP. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify us immediately by return e-mail or by e-mail to postmaster@kirkland.com, and destroy this communication and all copies thereof, including all attachments.
****

TAB 26

"Villafana, Ann Marie C. \(USAFLS\)"
[redacted]
09/24/2007 01:27 PM

To "Jay Lefkowitz" [redacted]
cc "Martin Weinberg" [redacted] "Lourie, Andrew" [redacted] "Garcia, Rolando \(USAFLS\)" [redacted]
bcc
Subject RE: Epstein agreement as reviewed by the U.S. Attorney

History: This message has been forwarded.

Hi Jay – Sorry for the delay. The U.S. Attorney had a last-minute concern, that I think I fixed (it is in the first "It Appearing" clause following the list of statutes potentially violated).

After you get the green light, let's discuss the potential representative. The person I am thinking of has run a preliminary conflicts check and it looks alright.

Also, to address Mr. Epstein's concern regarding the list of names, I wanted to tell you that I have compiled a list of 34 confirmed minors. There are six others, whose names we already have, who need to be interviewed by the FBI to confirm whether they were 17 or 18 at the time of their activity with Mr. Epstein. Once those interviews are completed, I can finalize the list of identified victims, which I will put in a formal document that I will maintain until the time of Mr. Epstein's sentencing.

Assuming that this agreement is fine, please execute at least three copies, and send one to me by fax and the rest by FedEx. I will execute and send the copies back.

Thank you.

A. Marie Villafaña

Assistant U.S. Attorney

500 S. Australian Ave, Suite 400

West Palm Beach, FL 33401

[redacted]

[redacted]

From: Jay Lefkowitz [redacted]
Sent: Monday, September 24, 2007 11:46 AM
To: Villafana, Ann Marie C. (USAFLS)
Cc: Martin Weinberg; Lourie, Andrew
Subject: Re: Epstein agreement as reviewed by the U.S. Attorney

Marie - Here are what I hope are final edits to the agreement. I will call in 15 min.
thanks -- Jay

"Villafana, Ann Marie C. \(USAFLS\)"
[redacted]
09/24/2007 10:13 AM

To "Jay Lefkowitz" [redacted]

cc

Subje ct Epstein agreement as reviewed by the U.S. Attorney

Hi Jay – Here is the agreement with Alex's edits. Thank you.

<<070924 Epstein Non-Prosecution Agreement w Acosta edits v2.pdf>>

A. Marie Villafaña

Assistant U.S. Attorney

500 S. Australian Ave, Suite 400

West Palm Beach, FL 33401

070924 Final Epstein Non-Prosecution Agreement.pdf

TAB 27

"Villafana, Ann Marie C. \(USAFLS\)" [redacted]
09/24/2007 04:34 PM

To [redacted]
cc
bcc
Subject RE: Do you have a signed copy?

Thank you, Jay. I have forwarded your message only to Alex, Andy, and Rolando. I don't anticipate it going any further than that. When I receive the originals, I will sign and return one copy to you. The other will be placed in the case file, which will be kept confidential since it also contains identifying information about the girls.

When we reach an agreement about the attorney representative for the girls, we can discuss what I can tell him and the girls about the agreement. I know that Andy promised Chief Reiter an update when a resolution was achieved. (Something I wouldn't have promised in light of what happened last year.) Rolando is calling, but Rolando knows not to tell Chief Reiter about the money issue, just about what crimes Mr. Epstein is pleading guilty to and the amount of time that has been agreed to. Rolando also is telling Chief Reiter not to disclose the outcome to anyone.

From: Jay Lefkowitz [redacted]
Sent: Monday, September 24, 2007 4:06 PM
To: Villafana, Ann Marie C. (USAFLS)
Subject: Re: Do you have a signed copy?

Marie - Please do whatever you can to keep this from becoming public.

thanks -- Jay

"Villafana, Ann Marie C. \(USAFLS\)" [redacted]
09/24/2007 04:04 PM

To "Jay Lefkowitz" [redacted]
cc
Subject Do you have a signed copy?

Hi Jay – Sorry to be a bother, but do you have a copy that at least contains Mr. Epstein's signature? I need to pass it along to the powers that be. Thanks.

TAB 28

"Villafana, Ann Marie C. \(USAFLS\)"
[redacted]
09/26/2007 11:01 AM

To "Jay Lefkowitz" [redacted]
cc
bcc
Subject RE: Other attorneys

History This message has been forwarded.

Hi Jay – Can you give me a call at [redacted] this morning? I am meeting with the agents and want to give them their marching orders regarding what they can tell the girls.

Also, please remove Babbitt and Searcy from the list. There is too great a chance of an appearance of impropriety with Babbitt and I received a bad report about Searcy last night.

Thank you.

A. Marie Villafaña

Assistant U.S. Attorney

500 S. Australian Ave, Suite 400

West Palm Beach, FL 33401

[redacted]

From: Villafana, Ann Marie C. (USAFLS)
Sent: Tuesday, September 25, 2007 8:37 PM
To: 'Jay Lefkowitz'
Subject: Other attorneys

Hi Jay – These four people were recommended. I have not contacted them to find out what their rates are. All are very active in the plaintiffs' bar in the West Palm area. Ted Babbitt would be my first choice of these four but I think he is conflicted out because one of his partners is married to an AUSA here. Stuart Grossman is probably my second choice.

Ted Babbitt -- http://www.babbitt-johnson.com/tbabbitt.html

Stuart Grossman -- http://www.grossmanandroth.com/sgrossman.htm

Chris Searcy -- http://www.searcylaw.com/CHRISTIANDSEARCY/tabid/935/default.aspx

Lake Lytal, Jr. -- http://www.lytalreiter.com/index.php?page_id=37

Talk to Jack Goldberger about this group. They are all very good personal injury lawyers, but I have concerns about whether there would be an inherent tension because they may feel that THEY might make more money (and get a lot more press coverage) if they proceed outside the terms of the plea agreement. (Sorry – I just have a bias against plaintiffs' attorneys.) One nice thing about Bert is that he is in Miami where there has been almost no coverage of this case.

Just so you know, I have never met Bert, but a good friend in our appellate section and one of the district judges in Miami are good friends with him and recommended him.

Can you let me know tomorrow? I am going to be out for a while starting on Friday, and I would like to get this underway before I leave.

Thank you.

A. Marie Villafaña

Assistant U.S. Attorney

500 S. Australian Ave, Suite 400

West Palm Beach, FL 33401

TAB 29

"Villafana, Ann Marie C. (USAFLS)"
[redacted]
10/05/2007 07:48 AM

To "Jay Lefkowitz" [redacted]
cc
bcc
Subject RE: Proposed Letter to Special Master

History: This message has been replied to and forwarded.

Good morning, Jay. We need to resolve the attorney issue today. It has been weeks since execution of the contract, and there is no need for further delay.

As far as the five attorney names that we will be providing, I propose Bert Ocariz, Katherine Ezell at Podhurst Orseck, Stuart Grossman, Ed Rogers, and Walter Cobath.

If you would like to use the same Special Master to resolve fees disputes as well as to handle the selection of the attorney, I would recommend that we use retired 11th Circuit Judge Joseph Hatchett instead of Judge Davis because of Judge Davis's health problems. (No one has contacted Judge Hatchett yet, but one of the District Judges in Miami mentioned him as a good choice.)

I am available for a conference call between 9:00 and 10:00, and between 3:15 and 6:00. Please call me on my cell [redacted] and let me know which of those times works best for you.

Thank you.

From: Jay Lefkowitz [redacted]
Sent: Wed 10/3/2007 4:26 PM
To: Villafana, Ann Marie C. (USAFLS)
Subject: Re: Proposed Letter to Special Master

Marie - I, too, am interested in speed. But I really need to go over this and then discuss with Jeffrey. So please do not send this to any Special Master before we discuss the next steps.

Thanks -- Jay

"Villafana, Ann Marie C. (USAFLS)" <[redacted]

10/03/2007 04:24 PM

To
"Jay Lefkowitz" [redacted]
cc
Subject
Proposed Letter to Special Master

Hi Jay - To move things along, I also have enclosed the proposed text of a letter to the Special Master.

<<PROPOSED Letter to Special Master.pdf>>

A. Marie Villafaña

Assistant U.S. Attorney

TAB 30

"Villafana, Ann Marie C. (USAFLS)"
[redacted]
09/27/2007 03:06 PM

To [redacted]
cc
bcc
Subject RE: Conference Call with Bert Ocariz

History: This message has been forwarded.

Hi Jay – I already told Bert that there is no indictment and, as I mentioned, he doesn't really need to/want to see the entire plea agreement, just the relevant paragraphs so that he understands what the scope of his representation will be. I think they would be happy knowing that their hourly rate will be paid when it is billed. The concern is, if all 40 girls decide they want to sue, they don't want to be in a situation where Mr. Epstein says this is getting too expensive, we won't pay any more attorneys' fees.

Two suggestions, that I haven't run past Bert, are:

1. Mr. Epstein signs a standard fee agreement, where one of his attorneys or accountants who is not working on the damages litigation receives a monthly bill with attorney's fees charged at an hourly rate and costs billed monthly. The bills will have any privileged information redacted. If there is a dispute about a bill that cannot be resolved, it will be submitted to a mediator for resolution.

2. If that is too open-ended for Mr. Epstein, do the hourly/monthly billing until Bert has had a chance to confer with all of the girls to determine how many want him to represent them. Once it is known how many girls will be represented by Bert, and maybe who those girls are, there can be a more educated discussion about estimated fees and costs.

Just some food for thought. I will be out of the office tomorrow, but I will be reachable by cell phone. I will make sure Bert is available and confirm the time with you.

A. Marie Villafaña
Assistant U.S. Attorney
500 S. Australian Ave, Suite 400
West Palm Beach, FL 33401
[redacted]

From: Jay Lefkowitz [redacted]
Sent: Thursday, September 27, 2007 2:53 PM
To: Villafana, Ann Marie C. (USAFLS)
Subject: Re: Conference Call with Bert Ocariz

Marie - I will not be able to get back to you until tomorrow. However, some of the questions he raised cause me

some serious concern.

1. Can we get a copy of the indictment (or can you tell me the nature of the crimes against the girls)?

Certainly he should not get a copy of any indictment.

2. When will it be possible to see the plea agreement so that we understand exactly what Epstein concedes to in the civil case?

I don't think he should get the plea agreement either.

3. Is there any cap or other limitation on attorney's fees that the defendant will pay in the civil case?

I can't imagine he would be entitled to anything other than an hourly fee.

4. What is the contemplated procedure for, and timing of, the payment of attorney's fees and costs?

In any event, I need to consider these issues carefully and I cannot agree to any of these issues before we speak. I would suggest we plan on talking tomorrow at 12 pm if you are available.

Jay

----- Original Message -----
From: "Villafana, Ann Marie C. (USAFLS)" [redacted]
Sent: 09/27/2007 10:51 AM AST
To: Jay Lefkowitz
Subject: Conference Call with Bert Ocariz

Hi Jay – Bert's firm has raised a number of good questions about how they are going to get paid and setting up a procedure that avoids any conflict of interest with their clients. Are you around today to do a conference call? Let me know what times work for you because Bert wants to get their conflicts counsel on the call with us.

These are some of the questions he sent to me. I told Bert that as part of our agreement we (the federal government) are not going to indict Mr. Epstein, but gave him an idea of the charges that we had planned to bring as related to 18 USC 2255. With respect to question 2, do I have your permission to send Bert just that section of the plea agreement that applies to the damages claims (I would recommend sending paragraphs 7 through 10, or at least 7 and 8)? Can you talk with your client about items 3 and 4? I envisioned Shook Hardy sending regular bills to you, with any privileged information redacted, and being paid like every other client pays the bills.

1. Can we get a copy of the indictment (or can you tell me the nature of the crimes against the girls)?

2. When will it be possible to see the plea agreement so that we understand exactly what Epstein concedes to in the civil case?

3. Is there any cap or other limitation on attorney's fees that the defendant will pay in the civil case?

4. What is the contemplated procedure for, and timing of, the payment of attorney's fees and costs?

A. Marie Villafaña

Assistant U.S. Attorney

500 S. Australian Ave, Suite 400

West Palm Beach, FL 33401

****
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including all attachments.
****

TAB 31

Inside the Bar

Find a Lawyer

Jeffrey Marc Herman

Member in Good Standing **Eligible to practice in Florida**

ID Number: - 521647

Address: Herman & Mermelstein P A
18205 Biscayne Blvd Ste 2218
North Miami Beach, Florida
331602148
United States

Phone: 305.9312200

E-Mail: jherman@hermanlaw.com

County: Miami-Dade

Circuit: 11

Admitted: 12/26/1985

10-Year Discipline History **None**

Firm: Herman Sloman & Mermelstein PA

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[Updated: 03-05-2008]

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TAB 32

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CASE NO.: 08-80069

CIV-MARRA

MAGISTRATE JUDGE JOHNSON

FILED by _____ D.C.
INTAKE
JAN 24 2008
CLARENCE MADDOX
CLERK U.S. DIST. CT.
S.D. OF FLA. • FT. LAUD.

JANE DOE NO. 1, by and through JANE DOE's FATHER as parent and natural guardian, and JANE DOE's FATHER, and JANE DOE's STEPMOTHER, individually,

Plaintiffs,

vs.

JEFFREY EPSTEIN,

Defendant.

_____/

COMPLAINT

Plaintiff, Jane Doe No. 1 ("Jane" or "Jane Doe"), by and through Jane Doe's Father as parent and natural guardian, and Jane Doe's Father and Jane Doe's Stepmother, individually, bring this Complaint against Jeffrey Epstein, as follows:

Parties, Jurisdiction and Venue

1. Jane Doe is a citizen and resident of the State of Florida. She is a minor under the age of 18 years.

2. Jane Doe's Father brings this action individually and as parent and natural guardian of Jane Doe. Jane Doe's Father is a citizen and resident of the State of Florida.

3. Jane Doe's Stepmother brings this action individually. Jane Doe's Stepmother is a citizen and resident of the State of Florida.

4. This Complaint is brought under fictitious names to protect the identity of the Minor Plaintiff because this Complaint makes sensitive allegations of sexual assault and abuse upon a

minor.

5. Defendant Jeffrey Epstein is a citizen and resident of the State of New York.

6. This is an action for damages in excess of $50 million.

7. This Court has jurisdiction of this action and the claims set forth herein pursuant to 28 U.S.C. §1332(a), as the matter in controversy (i) exceeds $75,000, exclusive of interest and costs; and (ii) is between citizens of different states.

8. This Court has venue of this action pursuant to 28 U.S.C. §1391(a) as a substantial part of the events or omissions giving rise to the claim occurred in this District.

Factual Allegations

9. At all relevant times, Defendant Jeffrey Epstein ("Epstein") was an adult male, 52 years old. Epstein is a financier and money manager with a secret clientele limited exclusively to billionaires. He is himself a man of tremendous wealth, power and influence. He maintains his principal home in New York and also owns residences in New Mexico, St. Thomas and Palm Beach, FL. The allegations herein concern Epstein's conduct while at his lavish estate in Palm Beach.

10. Upon information and belief, Epstein has a sexual preference and obsession for underage minor girls. He engaged in a plan and scheme in which he gained access to primarily economically disadvantaged minor girls in his home, sexually assaulted these girls, and then gave them money. In or about 2005, Jane Doe, then 14 years old, fell into Epstein's trap and became one of his victims.

11. Upon information and belief, Jeffrey Epstein carried out his scheme and assaulted girls in Florida, New York and on his private island, known as Little St. James, in St. Thomas.

12. An integral player in Epstein's Florida scheme was Haley Robson, a Palm Beach

Community College student from Loxahatchee, Florida. She recruited girls ostensibly to give a wealthy man a massage for monetary compensation in his Palm Beach mansion. Under Epstein's plan, Ms. Robson would be contacted when Epstein was planning to be at his Palm Beach residence or soon after he had arrived there. Epstein or someone on his behalf directed Ms. Robson to bring one or more underage girls to the residence. Ms. Robson, upon information and belief, generally sought out economically disadvantaged underage girls from Loxahatchee and surrounding areas who would be enticed by the money being offered - generally $200 to $300 per "massage" session - and who were perceived as less likely to complain to authorities or have credibility if allegations of improper conduct were made. This was an important element of Epstein's plan.

13. Epstein's plan and scheme reflected a particular pattern and method. Upon arrival at Epstein's mansion, Mr. Robson would introduce each victim to Sarah Kellen, Epstein's assistant, who gathered the girl's personal information, including her name and telephone number. Ms. Kellen would then bring the girl up a flight of stairs to a bedroom that contained a massage table in addition to other furnishings. There were photographs of nude women lining the stairway hall and in the bedroom. Ms. Kellen would then leave the girl alone in this room, whereupon Epstein would enter wearing only a towel. He would then remove his towel, lay down naked on the massage table, and direct the girl to remove her clothes. He then would perform one or more lewd, lascivious and sexual acts, including masturbation and touching the girl's vagina with a vibrator.

14. Consistent with the foregoing plan and scheme, Ms. Robson recruited Jane Doe to give Epstein a massage for monetary compensation. Ms. Robson brought Jane to Epstein's mansion in Palm Beach. Jane was introduced to Sarah Kellen, who led her up the flight of stairs to the room with the massage table. She was alone in the room when Epstein arrived wearing only a towel. He

HOUSE_OVERSIGHT_012639

removed his towel, and laid down naked on the massage table. He demanded that Jane remove her clothes. In shock, fear and trepidation, Jane complied, removing her clothes except for her underwear. Epstein then sexually assaulted Jane.

15. After Epstein had completed the assault, he left the room. Jane was then able to get dressed, leave the room and go back down the stairs. She then met Ms. Robson again who brought Jane home. Jane was paid $300 by Epstein. Ms. Robson was paid $200 by Epstein for bringing Jane to him.

16. As a result of this encounter with Epstein, the 14-year old Jane experienced confusion, shame, humiliation, embarrassment and the assault sent her life into a downward spiral.

COUNT I
Sexual Assault

17. Plaintiff Jane Doe by and through her Father, as parent and natural guardian, repeats and realleges paragraphs 1 through 16 above.

18. Epstein tortiously assaulted Jane Doe sexually in or about 2005.

19. This sexual assault was in violation of Chapter 800 of the Florida Statutes, which recognizes as a crime the lewd and lascivious acts committed by Epstein upon Jane.

20. As a direct and proximate result of Epstein's assault on Jane, she has suffered and will continue to suffer severe and permanent traumatic injuries, including mental, psychological and emotional damages.

WHEREFORE, Plaintiff Jane Doe, by and through her Father, as parent and natural guardian, demands judgment against Defendant Jeffrey Epstein for compensatory damages, punitive damages, costs, and such other and further relief as this Court deems just and proper.

HOUSE_OVERSIGHT_012640

COUNT II
Intentional Infliction of Emotional Distress

21. Plaintiffs Jane Doe by and through her Father, as parent and natural guardian, Jane Doe's Father and Jane Doe's Stepmother, individually, repeat and reallege paragraphs 1 through 16 above.

22. Epstein's conduct was intentional or reckless.

23. Epstein's conduct was outrageous, going beyond all bounds of decency.

24. Epstein's conduct caused severe emotional distress not only to Jane Doe, but also to her parents, Jane Doe's Father and Jane Doe's Stepmother. Epstein knew or had reason to know that his intentional and outrageous conduct would cause emotional trauma and damage to Jane Doe's parents.

25. As a direct and proximate result of Epstein's intentional or reckless conduct, Jane Doe, Jane Does' Father and Jane Doe's Stepmother have suffered and will continue to suffer severe mental anguish and pain.

WHEREFORE, Plaintiffs Jane Doe by and through her Father, as parent and natural guardian, Jane Doe's Father and Jane Doe's Stepmother demand judgment against Defendant Jeffrey Epstein for compensatory damages, costs, punitive damages, and such other and further relief as this Court deems just and proper.

COUNT III
Loss of Parental Consortium

26. Plaintiff Jane Doe's Father repeats and realleges paragraphs 1 through 16 above.

27. Epstein's tortious conduct is the direct and proximate cause of damages to Jane Doe's Father, consisting of parental loss of comfort, companionship and society and healthcare costs

associated with the treatment of Jane.

28. Jane Doe's Father experienced and will continue to experience great mental anguish, pain and suffering from the time that Defendant's tortious conduct occurred.

WHEREFORE, Plaintiff Jane Doe's Father demands judgment for loss of consortium damages, costs and such other and further relief as this Court deems proper.

JURY TRIAL DEMAND

Plaintiffs demand a jury trial in this action.

Dated: January 24, 2008

Respectfully submitted,

HERMAN & MERMELSTEIN, P.A.
Attorneys for Plaintiffs
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Miami, Florida 33160
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Fax: 305-931-0877

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HOUSE_OVERSIGHT_012642

Original
Filed by ELECTRONIC D.C.
March 5, 2008
STEVEN M. LARIMORE
CLERK U.S. DIST. CT.
S.D. OF FLA. - MIAMI

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CASE NO.:

08-CV-80232-Marra-Johnson

JANE DOE NO. 3,

Plaintiff,

vs.

JEFFREY EPSTEIN,

Defendant.

_____/

COMPLAINT

Plaintiff, Jane Doe No.3 ("Jane" or "Jane Doe"), brings this Complaint against Jeffrey Epstein, as follows:

Parties, Jurisdiction and Venue

1. Jane Doe is a citizen and resident of the State of Florida, and is sui juris.

2. This Complaint is brought under a fictitious name to protect the identity of the Plaintiff because this Complaint makes sensitive allegations of sexual assault and abuse upon her when she was a minor.

3. Defendant Jeffrey Epstein is a citizen and resident of the State of New York.

4. This is an action for damages in excess of $50 million.

5. This Court has jurisdiction of this action and the claims set forth herein pursuant to 28 U.S.C. §1332(a), as the matter in controversy (i) exceeds $75,000, exclusive of interest and costs; and (ii) is between citizens of different states.

6. This Court has venue of this action pursuant to 28 U.S.C. §1391(a) as a substantial part of the events or omissions giving rise to the claim occurred in this District.

HOUSE_OVERSIGHT_012644

Factual Allegations

7. At all relevant times, Defendant Jeffrey Epstein ("Epstein") was an adult male, 52 years old. Epstein is a financier and money manager with a secret clientele limited exclusively to billionaires. He is himself a man of tremendous wealth, power and influence. He maintains his principal home in New York and also owns residences in New Mexico, St. Thomas and Palm Beach, FL. The allegations herein concern Epstein's conduct while at his lavish estate in Palm Beach.

8. Upon information and belief, Epstein has a sexual preference and obsession for underage minor girls. He engaged in a plan and scheme in which he gained access to primarily economically disadvantaged minor girls in his home, sexually assaulted these girls, and then gave them money. In or about 2004-2005, Jane Doe, then 16 years old, fell into Epstein's trap and became one of his victims.

9. Upon information and belief, Jeffrey Epstein carried out his scheme and assaulted girls in Florida, New York and on his private island, known as Little St. James, in St. Thomas.

10. An integral player in Epstein's Florida scheme was Haley Robson, a Palm Beach Community College student from Loxahatchee, Florida. She recruited girls ostensibly to give a wealthy man a massage for monetary compensation in his Palm Beach mansion. Under Epstein's plan, Ms. Robson would be contacted when Epstein was planning to be at his Palm Beach residence or soon after he had arrived there. Epstein or someone on his behalf directed Ms. Robson to bring one or more underage girls to the residence. Ms. Robson, upon information and belief, generally sought out economically disadvantaged underage girls from Loxahatchee and surrounding areas who would be enticed by the money being offered - generally $200 to $300 per "massage" session - and who were perceived as less likely to complain to authorities or have credibility if allegations of

HOUSE_OVERSIGHT_012645

improper conduct were made. This was an important element of Epstein's plan.

11. Epstein's plan and scheme reflected a particular pattern and method. Upon arrival at Epstein's mansion, the victim would be brought to the kitchen. She would then be led up a flight of stairs to a bedroom that contained a massage table in addition to other furnishings. Once the girl was alone in this room, Epstein would enter wearing only a towel to cover his private area. He then would lay down on the massage table and perform one or more lewd, lascivious and sexual acts, including masturbation and touching the girl sexually.

12. Consistent with the foregoing plan and scheme, Ms. Robson recruited Jane Doe to give Epstein a massage for monetary compensation. Ms. Robson brought Jane to Epstein's mansion in Palm Beach. Jane was led up the flight of stairs to the room with the massage table. She was alone in the room when Epstein arrived wearing a towel to cover his private parts. He laid down on the massage table, and sexually assaulted Jane Doe during the massage. In addition, Jeffrey Epstein masturbated during the massage.

13. After Epstein had completed the assault, he left the room. Jane was then able to leave the room and go back down the stairs. She then met Ms. Robson again who brought Jane home. Jane was paid $200 by Epstein. Ms. Robson was also paid by Epstein for bringing Jane to him.

14. As a result of this encounter with Epstein, the 16-year old Jane experienced trauma, shock, confusion, shame, humiliation and embarrassment.

COUNT I
Sexual Assault

15. Plaintiff Jane Doe repeats and realleges paragraphs 1 through 14 above.

16. Epstein tortiously assaulted Jane Doe sexually in or about 2004-2005. Epstein's acts were intentional, unlawful, offensive and harmful.

17. Epstein's plan and scheme in which he committed such acts upon Jane Doe were done willfully and maliciously.

18. This sexual assault was in violation of Chapter 800 of the Florida Statutes, which recognizes as a crime the lewd and lascivious acts committed by Epstein upon Jane.

19. As a direct and proximate result of Epstein's assault on Jane, she has suffered and will continue to suffer severe and permanent traumatic injuries, including mental, psychological and emotional damages.

WHEREFORE, Plaintiff Jane Doe, demands judgment against Defendant Jeffrey Epstein for compensatory damages, punitive damages, costs, and such other and further relief as this Court deems just and proper.

COUNT II
Intentional Infliction of Emotional Distress

20. Plaintiffs Jane Doe repeats and realleges paragraphs 1 through 14 above.

21. Epstein's conduct was intentional or reckless.

22. Epstein's conduct was outrageous, going beyond all bounds of decency.

23. Epstein's conduct caused severe emotional distress to Jane Doe. Epstein knew or had reason to know that his intentional and outrageous conduct would cause emotional trauma and damage to Jane Doe.

24. As a direct and proximate result of Epstein's intentional or reckless conduct, Jane Doe has suffered and will continue to suffer severe mental anguish and pain.

WHEREFORE, Plaintiff Jane Doe demands judgment against Defendant Jeffrey Epstein for compensatory damages, costs, punitive damages, and such other and further relief as this Court

HOUSE_OVERSIGHT_012647

deems just and proper.

JURY TRIAL DEMAND

Plaintiffs demand a jury trial in this action.

Dated: March 4, 2008

Respectfully submitted,

HERMAN & MERMELSTEIN, P.A.
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Miami, Florida 33160
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HOUSE_OVERSIGHT_012648

CIVIL COVER SHEET

The JS-44 civil cover sheet and the information contained herein neither replace nor supplement the filing, and service of pleading or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of the Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

I(a) PLAINTIFFS
JANE DOE NO. 3,

(b) COUNTY OF RESIDENCE OF FIRST LISTED PLAINTIFF
PALM BEACH COUNTY
(EXCEPT IN U.S. PLAINTIFF CASES)

DEFENDANTS
JEFFREY EPSTEIN

COUNTY OF RESIDENCE OF FIRST LISTED DEFENDANT NEW YORK
(IN U.S. PLAINTIFF CASES ONLY)

(c) ATTORNEYS (FIRM NAME, ADDRESS, AND TELEPHONE NUMBER)
Herman & Mermelstein, P.A., 18205 Biscayne Blvd., Suite 2218, Miami, FL 33160, (305) 931-2200

ATTORNEYS (IF KNOWN)

(d) CIRCLE COUNTY WHERE ACTION AROSE: PALM BEACH

9:08CV 80232-KAM-Johnson

II. BASIS OF JURISDICTION
(PLACE AN X ONE BOX ONLY)

- ☐ 1. U.S. Government Plaintiff
- ☐ 3. Federal Question (U.S. Government Not a Party)
- ☐ 2. U.S. Government Defendant
- X 4. Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES
(For Diversity Case Only)

	PTF	DEF
Citizen of This State	X 1	☐ 1
Citizen of Another State	☐ 2	x 2
Citizen or Subject of a Foreign Country	☐ 3	☐ 3

PLACE AN X IN ONE BOX FOR PLAINTIFF AND ONE FOR DEFENDANT

	PTF	DEF
Incorporated of Principal Place of Business In This State	☐ 4	☐ 4
Incorporated and Principal Place of Business in Another State	☐ 5	☐ 5
Foreign Nation	☐ 6	☐ 6

IV. CAUSE OF ACTION (CITE THE U.S. CIVIL STATUTE UNDER WHICH YOU ARE FILING AND WRITE A BRIEF STATEMENT OF CAUSE. DO NOT CITE JURISDICTIONAL STATUTES UNLESS DIVERSITY.)
DIVERSITY ACTION UNDER 28 U.S.C. §1332(a) FOR SEXUAL ASSAULT

IVa. 5 days estimated (for both sides) to try entire case

V. NATURE OF SUIT (PLACE AN X IN ONE BOX ONLY)

A CONTRACT
- ☐ 110 Insurance
- ☐ 120 Marine
- ☐ 130 Miller Act
- ☐ 140 Negotiable Instrument
- ☐ 150 Recovery of Overpayment & Enforcement of Judgment
- ☐ 151 Medicare Act
- ☐ 152 Recovery of Defaulted Student Loans (Excl. Veterans) B
- ☐ 153 Recovery of Overpayment of Veteran's Benefits B
- ☐ 160 Stockholder's Suits
- ☐ 190 Other Contract
- ☐ 195 Contract Product Liability

A TORTS

PERSONAL INJURY
- ☐ 310 Airplane
- ☐ 315 Airplane Product Liability
- ☐ 320 Assault, Libel & Slander
- ☐ 330 Federal Employers' Liability
- ☐ 340 Marine
- ☐ 345 Marine Product Liability
- ☐ 350 Motor Vehicle
- ☐ 355 Motor Vehicle Product Liability
- X 360 Other Personal Injury
- ☐ 362 Personal Injury-Med Malpractice
- ☐ 365 Personal Injury-Product Liability
- ☐ 368 Asbestos Personnel Injury Product Liability

PERSONAL PROPERTY
- ☐ 370 Other Fraud
- ☐ 371 Truth in Lending B
- ☐ 380 Other Personnel Property Damage
- ☐ 385 Property Damage Product Liability

B FORFEITURE PENALTY
- ☐ 610 Agriculture
- ☐ 620 Other Food & Drug
- ☐ 625 Drug Related Seizure of Property 21 USC 881
- ☐ 630 Liquor Laws
- ☐ 640 R.R. & Truck
- ☐ 650 Airline Regs
- ☐ 660 Occupational Safety/Health
- ☐ 690 Other

A BANKRUPTCY
- ☐ 422 Appeal 28 USC 158
- ☐ 423 Withdrawal 28 USC 157

A PROPERTY RIGHTS
- ☐ 820 Copyrights
- ☐ 830 Patent
- ☐ 840 Trademark

B SOCIAL SECURITY
- ☐ 861 HIA (1395ff)
- ☐ 862 Black Lung (923)
- ☐ 863 DIWC/DIWW (405(g))
- ☐ 864 SSID Title XVI
- ☐ 865 RSI (405(g))

A FEDERAL TAX SUITS
- ☐ 870 Taxes (U.S. Plaintiff or Defendant)
- ☐ 871 IRS-Third Party 26 USC 7609

A OTHER STATUS
- ☐ 400 State Reapportionment
- ☐ 410 Antitrust
- ☐ 430 Banks and Banking
- ☐ 450 Commerce/ICC Rates/etc. B
- ☐ 460 Deportation
- ☐ 470 Racketeer Influenced and Corrupt Organizations
- ☐ 810 Selective Service
- ☐ 850 Securities/ Commodities/ Exchange
- ☐ 875 Customer Challenge 12USC3410
- ☐ 891 Agricultural Acts
- ☐ 892 Economic Stabilization Act
- ☐ 893 Environmental Matters
- ☐ 894 Energy Allocation Act
- ☐ 895 Freedom of Information Act
- ☐ 900 Appeal of Fee Determination Under Equal Access to Justice
- ☐ 950 Constitutionality of State Statutes
- ☐ 890 Other Statutory Actions* * A or B

Declaratory relief and state law claims for defamation

A REAL PROPERTY
- ☐ 210 Land Condemnation
- ☐ 220 Foreclosure B
- ☐ 230 Rent Lease & Ejectment
- ☐ 240 Torts to Land
- ☐ 245 Tort Product Liability
- ☐ 290 All Other Real Property

A CIVIL RIGHTS
- ☐ 441 Voting
- ☐ 442 Employment
- ☐ 443 Housing/Accommodations
- ☐ 444 Welfare
- ☐ 440 Other Civil Rights

B PRISONER PETITIONS
- ☐ 510 Motions to Vacate Sentence Habeas Corpus
- ☐ 530 General*
- ☐ 535 Death Penalty
- ☐ 540 Mandamus & Other*
- ☐ 550 Civil Rights *A or B

A LABOR
- X 710 Fair Labor Standards Act
- ☐ 720 Labor Management Relations B
- ☐ 730 Labor Management Reporting & Disclosure Act
- ☐ 740 Railway Labor Act
- ☐ 790 Other Labor Litigation
- ☐ 791 Employee Ret. Inc. Security Act B

FILED by _____ D.C.
INTAKE
MAR -5 2008
CLARENCE MADDOX
CLERK U.S. DIST. CT.
S.D. OF FLA.

VI. ORIGIN
- x 1. Original Proceeding
- ☐ 2. Removed from State Court
- ☐ 3. Remanded from Appellate Court
- ☐ 4. Reinstated (Specify)
- ☐ 5. Transferred from another district
- ☐ 6. Multidistrict Litigation
- ☐ 7. Appeal to District Judge from Magistrate Judgment

VII. REQUESTED IN COMPLAINT CHECK IF THIS IS A ☐ CLASS ACTION UNDER F.R.C.P. 23 DEMAND $ ☐ Check YES only if demanded in complaint: JURY DEMAND: ☐ YES ☐ NO

VIII. RELATED CASE(S) IF ANY (See Instructions): (SEE ATTACHED) JUDGE KENNETH A. MARRA DOCKET NUMBER 08-CV-80119-MARRA-JOHNSON
Jane Doe 2 v. Jeffrey Epstein

DATE 3-4-08 SIGNATURE OF ATTORNEY OF RECORD

UNITED STATES DISTRICT COURT
S/F 1-2
REV. 9/94

FOR OFFICE USE ONLY: Receipt No. _____ Amount: 350.00
Date Paid: _____ M/ifp: _____

542467

HOUSE_OVERSIGHT_012649

TAB 33

PalmBeachPost.com

PRINT THIS

Another suit alleges sex during massage

By LARRY KELLER

Palm Beach Post Staff Writer

Thursday, March 06, 2008

WEST PALM BEACH — Another woman filed a federal lawsuit against Jeffrey Epstein on Wednesday, alleging that he turned a massage she gave him at his Palm Beach mansion into a sexual episode when she was 16 years old.

Identified as "Jane Doe No. 3," she is seeking more than $50 million, the same as two other "Jane Does" who filed similar lawsuits in the past six weeks. All three suits were filed by Miami lawyer Jeffrey Herman.

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Herman subsequently withdrew the first Jane Doe's lawsuit because of squabbling by her parents over the litigation. The girl may refile the suit after she turns 18 in May and can make her own decisions, Herman said.

Other alleged victims also have contacted him, Herman said. "I do anticipate more cases," he said.

In the latest litigation, Jane Doe No. 3 alleges that she was recruited by a former college student, Haley Robson, to give Epstein a massage for money at his waterfront home late in 2004 or early in 2005.

The lawsuit alleges that, while on the massage table, Epstein sexually touched Jane Doe No. 3, then masturbated. She is suing on grounds of sexual assault and intentional infliction of emotional distress.

"She felt intimidated. She felt scared," Herman said. Jane Doe No. 3 made only the one visit to Epstein's home, he said.

"It's just another copycat lawsuit filed by the same lawyer who appears less interested in the truth than in grandstanding with these press conferences," said Jack Goldberger, one of Epstein's attorneys. "We now have sworn testimony that girls lied about their age to Jeffrey Epstein, and they were careful in being

HOUSE_OVERSIGHT_012651

convincing that they were over the age of 18."

Herman said Robson instructed Jane Doe No. 3, "When he asks how old you are, tell him 18 or 19 years old." But he said it doesn't matter. "They were underage girls," Herman said. "They were sexually assaulted."

In addition to the civil lawsuits, Epstein was indicted on a single count of felony solicitation of prostitution in July 2006 after a lengthy Palm Beach Police Department investigation into his activities with underage girls at his home. A resolution has been delayed continually. The case is on Monday's court docket but is expected to be rescheduled once again.

"One of the reasons (Jane Doe No. 3) came forward is she is tired of waiting for justice," Herman said.

Find this article at:
http://www.palmbeachpost.com/localnews/content/local_news/epaper/2008/03/06/s3b_epstein_0306.html?cxtype=rss&cxsvc=7&cxcat=76

☐ Check the box to include the list of links referenced in the article.

HOUSE_OVERSIGHT_012652

TAB 34

Jay Lefkowitz/New York/Kirkland-Ellis
Sent by: Kristin Andersen/New York/Kirkland-Ellis

12/12/2007 04:20 PM

To Ami Sheth/New York/Kirkland-Ellis@K&E
cc Eugene Kornel/New York/Kirkland-Ellis@K&E
bcc
Subject Fw: Epstein

---- Forwarded by Kristin Andersen/New York/Kirkland-Ellis on 12/12/2007 04:19 PM ----

"Sloman, Jeff (USAFLS)" [redacted]

11/27/2007 01:55 PM

To "Jay Lefkowitz" [redacted]
cc "Acosta, Alex (USAFLS)" [redacted]
Subject Epstein

Jay,

Please accept my apologies for not getting back to you sooner but I was a little under the weather yesterday. I hope that you enjoyed your Thanksgiving.

Regarding the issue of due diligence concerning Judge Davis' selection, I'd like to make a few observations. First, Guy Lewis has known for some time that Judge Davis was making reasonable efforts to secure Aaron Podhurst and Bob Josephsberg for this assignment. In fact, when I told you of Judge Davis's selection during our meeting last Wednesday, November 21st, you and Professor Dershowitz seemed very comfortable, and certainly not surprised, with the selection. Podhurst and Josephsberg are no strangers to nearly the entire Epstein defense team including Guy Lewis, Lili Ann Sanchez, Roy Black, and, apparently, Professor Dershowitz who said he knew Mr. Josephsberg from law school. Second, Podhurst and Josephsberg have long-standing stellar reputations for their legal acumen and ethics. It's hard for me to imagine how much more vetting needs to be done.

The United States has a statutory obligation (Justice for All Act of 2004) to notify the victims of the anticipated upcoming events and their rights associated with the agreement entered into by the United States and Mr. Epstein in a timely fashion. Tomorrow will make one full week since you were *formally* notified of the selection. I must insist that the vetting process come to an end. Therefore, unless you provide me with a *good faith* objection to Judge Davis's selection by COB tomorrow, November 28, 2007, I will authorize the notification of the victims. Should you give me the go-ahead on Podhurst and Josephsberg selection by COB tomorrow, I will simultaneously send you a draft of the letter. I intend to notify the victims by letter after COB Thursday, November 29th. Thanks,

Jeff

TAB 35

KIRKLAND & ELLIS LLP
AND AFFILIATED PARTNERSHIPS

777 South Figueroa Street
Los Angeles, California 90017

[redacted]

www.kirkland.com

Kenneth W. Starr
To Call Writer Directly:
[redacted]

Facsimile:
(213) 680-8500

November 28, 2007

VIA FACSIMILE

Honorable Alice S. Fisher
Assistant Attorney General
Department of Justice
Criminal Division
950 Pennsylvania Avenue NW
Room 2107
Washington, DC 20530

Re: *Jeffrey Epstein*

Dear Ms. Fisher:

I represent Jeffrey Epstein, who, as you may be aware, was the target of a dual investigation by both state and federal authorities in Florida for acts relating to his interactions with numerous young women. As you may also be aware, Mr. Epstein has entered into a Deferred Prosecution Agreement (the "Agreement") with the United States Attorney's Office for the Southern District of Florida (the "USAO") to resolve its criminal investigation of him. I am writing to request a meeting with you to discuss certain aspects of this case that I find especially troublesome.

As part of the agreement Mr. Epstein was required to sign to avoid a federal indictment, Mr. Epstein was required to waive jurisdiction and liability under 18 U.S.C. §2255 for the settlement of monetary claims that might be made by a group of unidentified alleged victims who will be identified by the USAO at some point in the future. Neither I, nor any of the other defense lawyers involved in this matter, have ever heard of such a procedure. And as part of this Agreement, Mr. Epstein is precluded from contesting liability as to civil lawsuits seeking monetary compensation for damages brought by any of the identified individuals who elect to settle their civil claims for the statutory minimum of either $50,000 (the amount set by Congress as of the date of the occurrences) or $150,000 (the amount currently set by statute) or some other agreed upon damage amount. We believe that the utilization of 18 U.S.C. § 2255 as a pre-condition of criminal plea agreements or non-prosecution agreements is highly unusual and requires careful consideration and additional guidance by your Office. We also believe that the

manner in which the USAO has interpreted the settlement process for these identified individuals under the Agreement requires guidance. These areas are more fully detailed below.*

First. Federal criminal investigators and prosecutors should not be in the business of promoting civil lawsuits as a condition precedent to entering non-prosecution or deferred prosecution agreements. This is especially true where the vehicle for the financial settlement under the Agreement requires payment in a lump sum without requiring proof of actual injury or loss — federal authorities should therefore be particularly sensitive to avoid causing a prejudiced and unfair result. 18 U.S.C. § 2255 is a civil statute implanted in the criminal code; in contrast to all other criminal restitution statutes, § 2255 fails to correlate payments to specific injuries or losses. Instead, the statute presumes that victims have sustained damages of at least a minimum lump sum without regard to whether the complainants suffered actual medical, psychological or other forms of individualized harm. We presume that it is for this reason that 18 U.S.C. § 2255 has never before been employed in this manner in connection with a non-prosecution or, as here, a deferred prosecution agreement. In short, the USAO is operating in uncharted territory.

Second. 18 U.S.C. § 2255 creates the potential for compromising witness testimony. Although generally the Government may promise or provide traditional consideration to potential witnesses, employing a civil statute that promises a lump sum payment to potential witnesses without proof of actual liability or damage provides an extraordinary incentive that is incompatible with the truth-seeking functions of the criminal justice system. Guidelines or other policy directives should be considered to control the extent to which witnesses are informed by investigators about the availability of such financial windfalls. Additionally, an inquiry is necessary in this specific case to assure that disclosures to potential witnesses did not undermine the reliability of the results of the federal criminal investigation of Mr. Epstein.

Third. The USAO has provided no information as to the specific claims made by each identified individual, nor were we provided the names or ages of those individuals or the time-frame of the alleged conduct. The USAO's reluctance to provide Mr. Epstein with *any* information with respect to the allegations against him leaves wide open the opportunity for misconduct by federal investigators. In addition, this information vacuum eliminates the ability for Mr. Epstein and/or his agents to verify that the allegations at issue are grounded in real evidence. Indeed, the requirement that a target of federal criminal prosecution agree to waive his right to contest liability as to *unnamed* civil complainants creates at minimum an appearance of injustice, both because of the obvious Due Process concerns of waiving rights without notice of

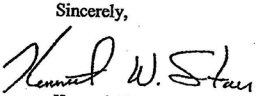
* In addition to the areas identified below, it was and remains our position that federal prosecution of this matter is entirely inappropriate based on the prior application and legislative histories of the relevant federal statutes.

even the identity of the complainant(s) and because of the involvement of the federal criminal justice system in civil settlements between private individuals.

Fourth. The USAO has improperly insisted that the chosen attorney representative should be able to litigate the claims of individuals, which violates the terms of the Agreement and deeply infringes upon the spirit and nature of the Agreement. Initially, for the sake of expediting a settlement in this matter, we suggested that Mr. Epstein establish a restitution fund specifically for the settlement of the identified individuals' civil claims and that an impartial, independent representative be appointed to administer that fund. Notably, such a restitution fund was created in a federal case, *U.S. v. Boehm*, Case No. 3:04CR00003 (D. Alaska 2004). The federal prosecutors here rejected this idea, and they insisted that an attorney representative, paid for by Mr. Epstein, be appointed. Yet, there was no suggestion at the time that the attorney representative's duties included litigating claims on behalf of the identified individuals. However, after the parties agreed to the appointment of an attorney representative, the prosecutors announced that the criteria for choosing an appropriate attorney representative now included that the individual be "a plaintiff's lawyer capable of handling multiple lawsuits against high profile attorneys." This interpretation of the scope of the attorney representative's role is far outside the common understanding that existed when we negotiated Mr. Epstein's settlement with the USAO. Furthermore, we firmly believe that ethics rules preclude the representative from litigating claims on behalf of the identified individuals.

In sum, we believe that the actions undertaken in this matter by the USAO with respect to the 18 U.S.C. § 2255 provisions of the Agreement are highly unusual. We respectfully request a meeting with you at your earliest convenience to discuss the important issues raised by the USAO's conduct in this deeply policy-laden matter.

Sincerely,



Kenneth W. Starr

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	1638
CONNECTION TEL	912025149412
SUBADDRESS	
CONNECTION ID	
ST. TIME	11/28 09:17
USAGE T	01'57
PGS.	4
RESULT	OK

KIRKLAND & ELLIS LLP

Fax Transmittal

777 South Figueroa Street
Los Angeles, California 90017
Phone: (213) 680-8400
Fax: (213) 680-8500

Please notify us immediately if any pages are not received.

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IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR, PLEASE NOTIFY US IMMEDIATELY AT: (213) 680-8400.

To:	*Company:*		[redacted]
Hon. Alice S. Fisher	Department of Justice		
From:	*Date:*	*Pages w/cover:*	
Kenneth W. Starr	November 28, 2007	4	

Message:

TAB 36

"Villafana, Ann Marie C. (USAFLS)"
[redacted]
11/28/2007 04:46 PM

To "Jay Lefkowitz" [redacted]
cc "Sloman, Jeff (USAFLS)" "Acosta, Alex (USAFLS)" [redacted]
bcc
Subject Epstein: Victim Notification Letter

History: This message has been replied to and forwarded.

Dear Jay:

Jeff asked that I forward the victim notification letter to you. It is attached.

Thank you.

<<Victim Notification Ltr.pdf>>

A. Marie Villafaña

Assistant U.S. Attorney

500 S. Australian Ave, Suite 400

West Palm Beach, FL 33401

[redacted]

Victim Notification Ltr.pdf

U.S. Department of Justice

United States Attorney
Southern District of Florida

500 South Australian Ave., Suite 400
West Palm Beach, FL 33401
(561) 820-8711
Facsimile: (561) 820-8777

November 29, 2007

DELIVERY BY HAND
Miss

Re: Crime Victims' Rights – Notification of Resolution of Epstein Investigation

Dear Miss _____:

Several months ago, I provided you with a letter notifying you of your rights as a victim pursuant to the Justice for All Act of 2004 and other federal legislation, including:

(1) The right to be reasonably protected from the accused.
(2) The right to reasonable, accurate, and timely notice of any public court proceeding involving the crime or of any release or escape of the accused.
(3) The right not to be excluded from any public court proceeding, unless the court determines that your testimony may be materially altered if you are present for other portions of a proceeding.
(4) The right to be reasonably heard at any public proceeding in the district court involving release, plea, or sentencing.
(5) The reasonable right to confer with the attorney for the United States in the case.
(6) The right to full and timely restitution as provided in law.
(7) The right to proceedings free from unreasonable delay.
(8) The right to be treated with fairness and with respect for the victim's dignity and privacy.

I am writing to inform you that the federal investigation of Jeffrey Epstein has been completed, and Mr. Epstein and the U.S. Attorney's Office have reached an agreement containing the following terms.

First, Mr. Epstein agrees that he will plead guilty to two state offenses, including the offense of soliciting minors to engage in prostitution, which will require him to register as a sexual predator for the remainder of his life.

Second, Mr. Epstein has agreed to make a binding recommendation of 18 months' imprisonment to the state court judge who sentences him. Mr. Epstein will serve that sentence of imprisonment at the Palm Beach County Jail.

Third, Mr. Epstein has agreed that he will not contest jurisdiction or liability if you elect to seek damages from him because the United States has identified you as a minor victim of certain federal offenses, including travel in interstate commerce to engage in prostitution with minors and the use of facilities of interstate commerce to induce minors to engage in prostitution. To assist you in making such a claim, the U.S. Attorney's Office has asked an independent Special Master to select attorneys to represent you. Those attorneys are Aaron Podhurst and Robert ("Bob") Josefsberg with the law firm of Podhurst Orseck, P.A. They can be reached at (305) 358-2800. I anticipate that someone from their law firm will be contacting you shortly. I must also advise you that you are not obligated to use these attorneys. In fact, you have the absolute right to select your own attorney, so you can decide not to speak with Mssrs. Podhurst/ Josefsberg at all, or you can speak with them and decide at any time to use a different attorney. If you do decide to seek damages from Mr. Epstein and you decide to use Messrs. Podhurst / Josefsberg as your attorneys, Mr. Epstein will be responsible for paying attorney's fees incurred during the time spent trying to negotiate a settlement. If you are unable to reach a settlement with Mr. Epstein, you and Mr. Josefsberg can discuss how best to proceed.

As I mentioned above, as part of the resolution of the federal investigation, Mr. Epstein has agreed to plead guilty to state charges. Mr. Epstein's change of plea and sentencing will occur on December 14, 2007, at _____ a.m., before Judge Sandra K. McSorley, in Courtroom 11F at the Palm Beach County Courthouse, 205 North Dixie Highway, West Palm Beach, Florida. Pursuant to Florida Statutes Sections 960.001(1)(k) and 921.143(1), you are entitled to be present and to make a statement under oath. If you choose, you can submit a written statement under oath, which will be filed by the State Attorney's Office on your behalf. If you elect to prepare a written statement, it should address the following:

> the facts of the case and the extent of any harm, including social, psychological, or physical harm, financial losses, loss of earnings directly or indirectly resulting from the crime for which the defendant is being sentenced, and any matter relevant to an appropriate disposition and sentence. Fl. Stat. 921.143(2).

You also are entitled to notification when Mr. Epstein is released from imprisonment at the end of his prison term and/or if he is allowed to participate in a work release program. To receive such notification, please provide the State Attorney's Office with the following information:

1. Your name
2. Your address
3. Your home, work, and/or cell phone numbers

4. Your e-mail address
5. A notation of whether you would like to participate in the "VINE system," which provides automated notification calls any time an inmate is moved. (To use this system, your calls must go to you directly, not through a switchboard.)

Thank you for all of your help during the course of the investigation. If you have any questions or concerns, please do not hesitate to contact me or Special Agent Nesbitt Kuyrkendall at (561) 822-5946.

Sincerely,

R. Alexander Acosta
United States Attorney

By:

A. Marie Villafaña
Assistant United States Attorney

cc: Special Agent Nesbitt Kuyrkendall, F.B.I.
Ms. Cleretha Wright, Victim-Witness Coordinator, U.S. Attorney's Office

TAB 37

"Sloman, Jeff (USAFLS)" [redacted]
02/27/2008 09:45 PM

To [redacted]
cc "Oosterbaan, Andrew" [redacted]
bcc
Subject Fw: Epstein

History: This message has been forwarded.

Sent from my BlackBerry Wireless Handheld

----- Original Message -----
From: Jeffrey Sloman [redacted]
To: Sloman, Jeff (USAFLS)
Sent: Wed Feb 27 21:37:02 2008
Subject: Epstein

Jay,

You have renewed your request for certain information which this Office does not generally make available in similar pre-indictment situations. After carefully considering your request, I have decided, in my capacity as the First Assistant U.S. Attorney, not to make an exception here.

Regarding the Landon Thomas matter, Mr. Thomas was given, pursuant to his request, non-case specific information concerning specific federal statutes.

Regarding the offer to extend the current deadline of March 3, 2008 contained in my February 25th email. That offer was based on counsel for Mr. Epstein meeting with CEOS the week of March 3rd. You indicate that you are unavailable. It is hard to imagine that some or all of the other attorneys representing Mr. Epstein cannot serve this function. After all, Mr. Epstein is also represented by Dean Kenneth Starr, Martin Weinberg, Roy Black, Gerald Lefcourt, Harvard Professor Alan Dershowitz, Lily Ann Sanchez, and Guy Lewis.

That being said, the Southern District of Florida will only renew the offer to extend the current deadline if you and the CEOS Section Chief mutually agree on a timetable by close of business on Friday, February 29, 2008 to meet and complete presentations no later than March 19, 2008. Given that CEOS is ready to proceed immediately, this seems like more than ample time. As I indicated in my previous email, if CEOS subsequently decides that a federal prosecution should not be undertaken against Mr. Epstein, this Office will close its investigation. However, should CEOS disagree with Mr. Epstein's position, Mr. Epstein shall have one week to abide by the terms and conditions of the September 24, 2007 Agreement as amended by letter from United States Attorney Acosta.

Jeffrey H. Sloman

First Asst. US Attorney

Southern District of Florida

TAB 38

UNITED STATES DEPARTMENT OF JUSTICE

Criminal Division
Child Exploitation and Obscenity Section

1400 New York Avenue, NW
Suite 600
Washington, DC 20530-0001
20005

CEOS: (202) 514-5780
FAX: (202) 514-1793

TO: R. Alexander Acosta, Esq.
Jay Lefkowitz, Esq.

OFFICE NUMBER:

FAX NUMBER: [redacted]

FROM: Alexandra Gelber

DATE/TIME: May 16, 2008

OFFICE NUMBER: (202) 514-5780

NUMBER OF PAGES, EXCLUDING THIS SHEET: 5

SPECIAL INSTRUCTIONS:

U.S. Department of Justice

Criminal Division

Andrew G. Oosterbaan, Chief

Child Exploitation and Obscenity Section

1400 New York Avenue, NW
Suite 600
Washington, DC 20530
(202) 514-5780 FAX: (202) 514-1793

May 15, 2008

Jay Lefkowitz, Esq.
Kirkland & Ellis LLP
Citigroup Center
153 E. 53rd St.
New York, NY 10022-4611

Re: *Investigation of Jeffery Epstein*

Dear Mr. Lefkowitz:

Pursuant to your request and the request of U.S. Attorney R. Alexander Acosta, we have independently evaluated certain issues raised in the investigation of Jeffrey Epstein to determine whether a decision to prosecute Mr. Epstein for federal criminal violations would contradict criminal enforcement policy interests. As part of our evaluation, we have reviewed letters written on behalf of Mr. Epstein on February 1, 2007, June 25, 2007, July 6, 2007, March 28, 2008, April 8, 2008, April 28, 2008, and May 14, 2008, with their attachments. We have also reviewed memos prepared by the U.S. Attorney's Office. As you will recall, we met with you and other representatives of Mr. Epstein to further discuss your views on the propriety of a federal prosecution. We have discussed the factual and legal issues you raise with the Criminal Division's Appellate Section, and we consulted with the Office of Enforcement Operations concerning the petite policy.

We are examining the narrow question as to whether there is a legitimate basis for the U.S. Attorney's Office to proceed with a federal prosecution of Mr. Epstein. Ultimately, the prosecutorial decision making authority within a U.S. Attorney's Office lies with the U.S. Attorney. Therefore, to borrow a phrase from the case law, the question we sought to answer was whether U.S. Attorney Acosta would abuse his discretion if he authorized prosecution in this case.

As you know, our review of this case is limited, both factually and legally. We have not looked at the entire universe of facts in this case. It is not the role of the Criminal Division to re-conduct a complete factual inquiry from scratch. Furthermore, we did not analyze any issues concerning prosecution under federal statutes that do not pertain to child exploitation, such as the money laundering statutes.

As was made clear at the outset, we did not review the facts, circumstances, or terms included in the plea offer, nor any allegations that individuals involved in the investigation engaged in misconduct. Despite that agreement, we note that your letters of April 8, April 28, and May 14 focus in large part on accusations of investigative or prosecutorial misconduct. Not only do allegations of prosecutorial misconduct fall outside the boundary of our agreed review, they also fall outside the authority of the Criminal Division in the first instance. Simply, the Criminal Division does not investigate or resolve allegations of professional misconduct by federal prosecutors. For these reasons, we do not respond to the portion of those letters that discuss alleged misconduct.

Based on our review of all of these materials, and after careful consideration of the issues, we conclude that U.S. Attorney Acosta could properly use his discretion to authorize prosecution in this case. We will briefly address each of the issues that you have raised.

Knowledge of age. Federal child exploitation statutes differ as to whether there must be proof that the defendant was aware that the children were under the age of 18. However, even for those statutes where knowledge of age is an element of the offense, it is possible to satisfy that element with proof that the defendant was deliberately ignorant of facts which would suggest that the person was a minor. For that reason, the fact that some of the individuals allegedly lied to Mr. Epstein about their age is not dispositive of the issue. While there may be an open factual issue as to Mr. Epstein's knowledge, we cannot say that it would be impossible to prove knowledge of age for any such charges which require it. Therefore, Mr. Acosta could rightfully conclude that this factual issue is best resolved by a jury.

Travel for the purpose. In the materials you prepared, you suggest that Mr. Epstein should not be charged with violating 18 U.S.C. § 2423(b) because his dominant purpose in going to Florida was not to engage in illegal sexual activity, but rather to return to one of his residences. While we fully understand your argument, we also find that the U.S. Attorney's office has a good faith basis fully to develop the facts on this issue and brief the law to permit a court to decide whether the law properly reaches such conduct. Mr. Acosta would not be abusing his discretion if he decided to pursue such a course of action.

Intent to engage in the conduct at the time of travel. Based on our review of the facts of this case, we respectfully disagree that there is no evidence concerning Mr. Epstein's intent when he traveled, and when that intent was formed. Should Mr. Acosta elect to let the case proceed so that a jury can resolve this factual issue, he would be within his discretion to do so.

Use of a facility or means of interstate or foreign commerce. Much of the materials you have prepared and much of the meeting we had focused on 18 U.S.C. § 2422(b), specifically your contention that Mr. Epstein did not use the phone to coerce anyone to engage in illegal sexual activity. We understand the issue you raise concerning the statutory interpretation. As before, however, we cannot agree that there is no evidence that would support a charge under Section 2422(b), nor can we agree that there is no argument in support of the application of that statute to this case. Finally, our assessment is that the application of that statute to these facts would not be

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so novel as to implicate the so-called "clear statement rule," the *Ex Post Facto* clause, or the Due Process clause. As with the other legal issues, Mr. Acosta may elect to proceed with the case.

Absence of coercion. With respect to 18 U.S.C. § 1591, the alleged absence of the use of force, fraud, or coercion is of no moment. The statute does not require the use of force, fraud, and coercion against minors. Because of their age, a degree of coercion is presumed. In your materials, you note that the statute requires that the minors must be "caused" to engage in a commercial sex act, further arguing that the word "cause" suggests that a certain amount of undue influence was used. We reject that interpretation, as it would read back into the offense an element–coercion–that Congress has expressly excluded. We have successfully prosecuted defendants for the commercial sexual exploitation of minors, even when the minors testified that not only did they voluntarily engage in the commercial sex acts, it was their idea to do so. As such, Mr. Acosta could properly decide to pursue charges under Section 1591 even if there is no evidence of coercion.

More broadly, a defendant's criminal liability does not hinge on his victim identifying as having suffered at his hands. Therefore, a prosecution could proceed, should Mr. Acosta decide to do so, even though some of the young women allegedly have said that they do not view themselves as victims.

Witness credibility. As all prosecutors know, there are no perfect witnesses. Particularly in cases involving exploited children, as one member of your defense team, Ms. Thacker, surely knows from her work at CEOS, it is not uncommon for victim-witnesses to give conflicting statements. The prosecutors are in the best position to assess the witness's credibility. Often, the prosecutor may decide that the best approach is to present the witness, let defense counsel explore the credibility problems on cross-examination, and let the jury resolve the issue. Mr. Acosta would be within his authority to select that approach, especially when here there are multiple, mutually-corroborating witnesses.

Contradictions and omissions in the search warrant application. We have carefully reviewed the factual issues you raise concerning the search warrant application. For a search warrant to be suppressed, however, the factual errors must be material, and the officers must not have proceeded in good faith. Despite the numerous factual errors you describe, the U.S. Attorney's Office could still plausibly argue that the mistakes–whether inadvertent or intentional–were not material to the determination that probable cause existed for a search, and that the search was in good faith in any event. As such, Mr. Acosta could properly elect to defend the search warrant in court rather than forego prosecution.

Petite Policy: After reviewing the petite policy and consulting with the Office of Enforcement Operations ("OEO"), we conclude that the petite policy does not prohibit federal prosecution in this case. According to the U.S. Attorney's Manual, the petite policy "applies whenever there has been a prior state or federal prosecution resulting in an acquittal, a conviction, including one resulting from a plea agreement, or a dismissal or other termination of

HOUSE_OVERSIGHT_012672

the case on the merits after jeopardy has attached." USAM 9-2.031(C). Our understanding is that the state case is still pending. As such, the procedural posture of the state case does not implicate the petite policy.

We recognize that the petite policy could be triggered if the state case concluded after a federal indictment was issued but prior to the commencement of any federal trial. *Id.* However, the policy "does not apply ... where the [state] prosecution involved only a minor part of the contemplated federal charges." USAM 9-2.031(B). Based on our understanding of the possible federal charges and existing state charges, we do not think the petite policy would be an issue should federal proceedings take place.

Federalism and Prosecutorial Discretion. All of the above issues essentially ask whether a federal prosecution *can* proceed. We understand, however, that you also ask whether a federal prosecution *should* proceed, even in the event that all of the elements of a federal offense could be proven. On this issue, you raised two arguments: that the conduct at issue here is traditionally a state concern because the activity is entirely local, and that the typical prosecution under federal child exploitation statutes have different facts than the ones implicated here. You have essentially asked us to look into whether a prosecution would so violate federal prosecutorial policy that a United States Attorney's Office should not pursue a prosecution. We do not think that is the case here for the following reasons.

Simply, the commercial sexual exploitation of children is a federal concern, even when the conduct is local, and regardless of whether the defendant provided the child (the "pimp") or paid for the child (the "john"). In your materials, you refer to a letter sent by the Department of Justice to Congress in which the Department expresses concern over the expansion of federal laws to reach almost all instances of prostitution. In that portion of the letter, the Department was expressly referring to a proposed federal law that reach adult prostitution where no force, fraud, or coercion was used. Indeed, the point being made in that letter is that the Department's efforts are properly focused on the commercial sexual exploitation of children and the exploitation of adults through the use of force, fraud, or coercion. As such, there is no inconsistency between the position taken in that letter and the federal prosecution of wholly local instances of the commercial sexual exploitation of children.

If Congress wanted to limit the reach of federal statutes only to those who profit from the commercial sexual exploitation of children, or only to those who actually traffic children across state lines, it could have done so. It did not. Finally, that a prosecution of Mr. Epstein might not look precisely like the cases that came before it is not dispositive. We can say with confidence that this case is consistent in principle with other federal prosecutions nationwide. As such, Mr. Acosta can soundly exercise his authority to decide to pursue a prosecution even though it might involve a novel application of a federal statute.

Conclusion. After carefully considering all the factual and legal issues raised, as well as the arguments concerning the general propriety of a federal case against Mr. Epstein on these

facts, we conclude that federal prosecution in this case would not be improper or inappropriate. While you raise many compelling arguments, we do not see anything that says to us categorically that a federal case should not be brought. Mr. Acosta would not be abusing his prosecutorial discretion should he authorize federal prosecution of Mr. Epstein.

Sincerely yours,

Andrew G. Oosterbaan
Chief

cc: AAG Alice S. Fisher
DAAG Sigal P. Mandelker
U.S. Attorney R. Alexander Acosta

HOUSE_OVERSIGHT_012674

TAB 39

Jay Lefkowitz/New York/Kirkland-Ellis
Sent by: Kristin Andersen/New York/Kirkland-Ellis

12/12/2007 04:19 PM

To Ami Sheth/New York/Kirkland-Ellis@K&E
cc Eugene Kornel/New York/Kirkland-Ellis@K&E
bcc
Subject Fw: Epstein

----- Forwarded by Kristin Andersen/New York/Kirkland-Ellis on 12/12/2007 04:19 PM -----

Jay Lefkowitz/New York/Kirkland-Ellis

11/28/2007 04:29 PM

To "Sloman, Jeff (USAFLS)" [redacted]
cc "Acosta, Alex (USAFLS)"
Subject Re: Epstein

Dear Jeff:

I received your email yesterday and was a little surprised at the tone of your letter, given the fact that we spoke last week and had what I thought was a productive meeting. I was especially surprised given that your letter arrived on only the second day back to work after the Thanksgiving Holiday, and yet your demands regarding timing suggest that I have been sitting on my hands for days.

You should know that the first time I learned about Judge Davis's selection of Podhurst and Josephsberg, and indeed the first time I ever heard their names, was in our meeting with you on Wednesday of last week. Nevertheless, I have now been able to confer with my client, and we have determined that the selection of Podhurst and Josephsberg are acceptable to us, reserving, of course, our previously stated objections to the manner in which you have interpreted the section 2255 portions of the Agreement.

We do, however, strongly and emphatically object to your sending a letter to the alleged victims. Without a fair opportunity to review and the ability to make objections to this letter, it is completely unacceptable that you would send it without our consideration. Additionally, given that the US Attorney's office has made clear it cannot vouch for the claims of the victims, it would be incendiary and inappropriate for your Office to send such a letter. Indeed, because it is a certainty that any such letter would immediately be leaked to the press, your actions will only have the effect of injuring Mr. Epstein and promoting spurious civil litigation directed at him. We believe it is entirely unprecedented, and in any event, inappropriate for the Government to be the instigator of such lawsuits.

Finally, we disagree with your view that you are required to notify the alleged victims pursuant to the Justice for All Act of 2004. First, 18 USC section 2255, the relevant statute under the Non-Prosecution Agreement for the settlement of civil remedies, does not have any connection to the Justice for All Act. Section 2255 was enacted as part of a different statute. Second, the Justice for All Act refers to restitution, and section 2255 *is* not a restitution statute. It is a civil remedy. As you know, we had offered to provide a restitution fund for the alleged

it is a civil remedy. As you know, we had offered to provide a restitution fund for the alleged victims in this matter; however that option was rejected by your Office. Had that option been chosen, we would not object to your notifying the alleged victims at this point. At this juncture, however, we do not accept your contention that there is a requirement that the government notify the alleged victims of a potential civil remedy in this case.

Accordingly, for all the reasons we have stated above, we respectfully -- and firmly -- object to your sending any letter whatsoever to the alleged victims in this matter. Furthermore, if a letter is to be sent to these individuals, we believe we should have a right to review and make objections to that submission prior to it being sent to any alleged victims. We also request that if your Office believes that it must send a letter to go to the alleged victims, who still have not been identified to us, it should happen only after Mr. Epstein has entered his plea. This letter should then come from the attorney representative, and not from the Government, to avoid any bias.

As you know, Judge Starr has requested a meeting with Assistant Attorney General Fisher to address what we believe is the unprecedented nature of the section 2255 component of the Agreement. We are hopeful that this meeting will take place as early as next week. Accordingly, we respectfully request that we postpone our discussion of sending a letter to the alleged victims until after that meeting. We strongly believe that rushing to send any letter out this week is not the wisest manner in which to proceed. Given that Mr. Epstein will not even enter his plea for another few weeks, time is clearly not of the essence regarding any notification to the identified individuals.

Thanks very much,

Jay

"Sloman, Jeff (USAFLS)" [redacted]

"Sloman, Jeff (USAFLS)"
[redacted]
11/27/2007 01:55 PM

To "Jay Lefkowitz" [redacted]
cc "Acosta, Alex (USAFLS)" [redacted]
Subject Epstein

Jay,

Please accept my apologies for not getting back to you sooner but I was a little under the weather yesterday. I hope that you enjoyed your Thanksgiving.

Regarding the issue of due diligence concerning Judge Davis' selection, I'd like to make a few observations. First, Guy Lewis has known for some time that Judge Davis was making reasonable efforts to secure Aaron Podhurst and Bob Josephsberg for this assignment. In fact, when I told you of Judge Davis's selection during our meeting last Wednesday, November 21st,

you and Professor Dershowitz seemed very comfortable, and certainly not surprised, with the selection. Podhurst and Josephsberg are no strangers to nearly the entire Epstein defense team including Guy Lewis, Lili Ann Sanchez, Roy Black, and, apparently, Professor Dershowitz who said he knew Mr. Josephsberg from law school. Second, Podhurst and Josephsberg have long-standing stellar reputations for their legal acumen and ethics. It's hard for me to imagine how much more vetting needs to be done.

The United States has a statutory obligation (Justice for All Act of 2004) to notify the victims of the anticipated upcoming events and their rights associated with the agreement entered into by the United States and Mr. Epstein in a timely fashion. Tomorrow will make one full week since you were *formally* notified of the selection. I must insist that the vetting process come to an end. Therefore, unless you provide me with a *good faith* objection to Judge Davis's selection by COB tomorrow, November 28, 2007, I will authorize the notification of the victims. Should you give me the go-ahead on Podhurst and Josephsberg selection by COB tomorrow, I will simultaneously send you a draft of the letter. I intend to notify the victims by letter after COB Thursday, November 29th. Thanks,

Jeff

TAB 40

TAX MATTERS- IRS Circular 230 Disclosure: To ensure compliance with requirements imposed by the IRS, we inform you that any tax advice contained in this communication (including attachments) was not intended or written to be used, and cannot be used, for the purpose of (i) avoiding penalties under the Internal Revenue Code or (ii) promoting, marketing or recommending to another party any transaction or matter addressed herein. If you would like such advice, please contact us.*

***Attention: The information contained in this E-mail message is attorney privileged and confidential information intended only for the use of the individual(s) named above. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copy of this communication is strictly prohibited. If you have received this communication in error, please contact the sender by reply E-mail and destroy all copies of the original message. Thank you.

----- Message from "A. on Fri, -----

To: "Lilly
Subject: Menchel

Dear Lilly:

Thank you for your letter of August 2nd regarding your proposal on how to resolve the Epstein matter.

As we explained at our meeting on July 31, 2007, the Office believes that the federal interest will not be vindicated in the absence of a two-year term of state imprisonment for Mr. Epstein. That offer was not meant as a starting point for negotiations, it is the minimum term of imprisonment that will obviate the need for federal prosecution. The Office has never agreed that a state prison sentence is not appropriate for Mr. Epstein. Rather we simply stated that if Mr. Epstein preferred to serve his sentence in a federal penetentiary, we would be willing to explore a federal conviction that may allow that in lieu of any state resolution. Further, as I made clear in

our follow up telephone conversation after the meeting, a plea to two federal misdemeanors was never extended or meant as an offer.

We also would reiterate that the agreement to Section 2255 liability applies to all of the minor girls identified during the federal investigation, not just the 12 that form the basis of an initial planned charging instrument.

As you know, the ability to engage in flexible plea negotiations is dramatically changed upon the return of an indictment. Once an indictment is returned, the Office does not intend to file a Superseding Information containing a lesser charge or to dismiss the case in favor of state prosecution.

Please let us know your client's decision by no later than August 17. I have conferred with U.S. Attorney Acosta who has asked me to communicate that the two-year term of incarceration is a non-negotiable minimum to vindicate a federal interest, and, at this time, he is not inclined to meet with counsel for Mr. Epstein.

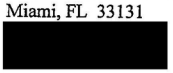
Sincerely,

R. Alexander Acosta
United States Attorney

By:
Matthew Menchel
Chief, Criminal Division

cc: Roy Black
Gerald Lefcourt
R. Alexander Acosta
Jeffrey Sloman
Andrew Lourie
A. Marie Villafaña

Margot Moss, Esq.
Fowler White Burnett, PA
Espirito Santo Plaza
1395 Brickell Avenue, 14th Floor
Miami, FL 33131



TAB 41

"Sloman, Jeff (USAFLS)" [redacted]
10/31/2007 04:33 PM

To "Jay Lefkowitz" [redacted]
cc
bcc
Subject Epstein

Jay,

Your understanding from Jack Goldberger conforms to my understanding that Mr. Epstein's plea and sentence will take place on the same day. I understand that the plea and sentence will occur on or before the January 4th date.

Jeff

From: [redacted]
Sent: 2/17/2011 6:19:01 PM
To: jeevacation@gmail.com
Subject: Trump & Patricia Kluge

Importance: High

Trump in talks to buy socialite Kluge's Charlottesville vineyard and estate

By Annie Gowen and Steve Yanda
Washington Post Staff Writers
Wednesday, February 16, 2011; 10:47 PM

Embattled Virginia socialite and winemaker Patricia Kluge may have found a white knight to preserve her Charlottesville empire - real estate mogul Donald Trump.

Trump's business adviser said Wednesday that Trump was negotiating to buy not only Kluge's grand estate, Albemarle House, which a bank foreclosed on in January, but all of Kluge's former real estate holdings outside Charlottesville near Thomas Jefferson's Monticello estate.

Those include 200 acres of land adjacent to the estate that once had a nine-hole golf course designed by Arnold Palmer, a 900-acre vineyard and a failed real estate development where Kluge had planned to market luxury "farmettes" with their own grapevines.

Leslie Goldman, a Washington-based adviser to Trump, said it would be "premature to speculate" what Trump had planned for the area, but said the land has "significant historical value and potential for development."

"Obviously, the more acreage, the more pieces you acquire, the more possibilities there are," he said.

Trump has already made forays into Virginia real estate. In 2009, he purchased a 600-acre golf club along the Potomac River in Loudoun County and renamed it the Trump National Golf Club. He raised the ire of local environmentalists last summer after the club removed hundreds of trees that it claimed threatened the shoreline.

Trump's representative appeared at a foreclosure auction of Kluge's large estate on the courthouse steps in downtown Charlottesville Wednesday morning, where a crowd of about 50 lawyers and curiosity seekers had gathered.

In the past year, Kluge's travails have become well-known around Charlottesville, where over the last two decades the British-born socialite has cut a glamorous - and sometimes controversial - figure.

In 1999 she founded what became a well-respected vineyard on land around her grand house, which she had received as part of a high-profile divorce settlement in 1990 from John Kluge, the late media mogul who was once the country's richest man.

Kluge Estate Winery and Vineyard won accolades for sparkling wines - served at the White House and at Chelsea Clinton's wedding last summer - and a blended red called New World Red. Kluge and her third husband, retired IBM executive William Moses, worked to promote not only their own wine brand but the growing Virginia wine industry as a whole.

But in the past two years, following some aggressive expansion of the winery and the failure of the housing development, Kluge fell upon hard times. Credit problems forced her to sell off her jewelry and extensive collection of art and antiques last year. She lost the vineyard at a foreclosure auction in December.

Kluge had initially tried to sell Albemarle House - which the Sotheby's listing calls "one of the most important residences in the United States since the Golden Age" - for $100 million, but when no buyer came forward the price was ultimately slashed to $24 million. The eight-bedroom home has its own movie theater, wine grotto, swimming pool and helipad.

At Wednesday's auction, Bank of America, Kluge's creditor, took full ownership of the property with a bid of $15.26 million. But Trump holds what the lawyers called a "right of first refusal" to buy the property at a later date.

Kluge and Moses declined to comment directly on yesterday's events, but both have said they have been working diligently with their lawyers over the last several months to help save their business.

The Trump organization had been working closely with Kluge and Moses on the deal, but how the partnership will play out - if they would have a future role at what would be Trump's vineyard - remained unclear Wednesday.

"They've been working together with the objective of trying to preserve the vineyard for the benefit of the Virginia wine industry," Goldman said. "If it all comes together, it may provide them an opportunity to continue to stay involved in their life's work."

Yanda reported from Charlottesville. Staff researcher Magda Jean-Louis also contributed to this report.

From: Stephanie[redacted]
Sent: 3/4/2011 11:15:40 PM
To: Peggy Siegal[redacted]jeevacation@gmail.com
Subject: RE: Oscar diary
Attachments: Oscar story.doc

Importance: High

Jeffrey,

Peggy's story is attached to the e-mail. I have included the story in the body of the e-mail as well.

Thanks,

Stephanie

Omar Quadhafi is hunkering down in Tripoli giving press interviews denying that rebels are taking over Eastern Libya. Oil prices are shooting over one hundred dollars a barrel. The US government is on the verge of a shut down. These are not the top secret opening lines to Aaron Sorkin's new script, but the global headlines of a world spinning out of control. I head to Los Angeles like an overdressed lemming to attend the 83rd Academy Awards and attempt to make sense of artists thrust into combat.

For the second year nearly 6,000 Academy members have nominated 10 films and the battle is down to two. The beloved timeless classic, "The King's Speech" marches into the arena as the front runner, but passionate supporters of the brilliant edgier (and critics darling) "The Social Network" have not conceded. The ballots are counted, the party invites are out and still the feelings are raw. Filmmakers are exhausted from campaigning.

At Bryan Lourd's famous star studded party Sony Classics' Co-President Michael Barker announces to me he has taken a random sampling of voters in the room. He says, "There will be a 'Social Network' upset at the Kodak Theater." Shear panic radiates from my every pore as he says, "I am joking." It's like color war at summer camp.

Woody Allen and George Lucas tell me they are no longer members of the Academy because pitting artists against each other to determine the quality of their work is insane. They are right.

My event and publicity company is considered "Switzerland" by the studios, as we help every filmmaker to present and position his work. This year I am somewhat emotionally sucked in.

In 2005 I meet the unknown 32-year-old English director Tom Hooper on his first film for HBO,"Elizabeth I". The Emmy award winning movie stars Helen Mirren, who takes credit for discovering him directing English television. Helen later wins her Oscar for portraying Queen Elizabeth in "The Queen". Queen Elizabeth is the daughter of King George VI portrayed by Oscar winner Colin Firth in "The King's Speech".

I also become Hooper's champion encouraging many to see his early work including his herculean 10 hour HBO mini-series "John Adams" produced by Tom Hanks.

Six years later at the Telluride Film Festival Tom Hooper is bathing in the glory of a hysterical standing ovation with Colin Firth and Geoffrey Rush at the very first screening of "The King's Speech." Surprisingly, this drama's subtle humor gets big laughs leading up to its emotional ending.

Within two weeks, at The Toronto Film Festival, Harvey Weinstein is now standing with his filmmakers witnessing the same reaction. The film wins The Audience Prize. Their strategy is to say nothing. Do nothing. They have a possible Oscar winner. Four out of five past Best Pictures have premiered in Toronto.

Cut to New York City at the end of September. It's the opening night at The Film Society of Lincoln Center. One of America's most important and prolific producers Scott Rudin, along with Jesse Eisenberg, Andrew Garfield and Aaron Sorkin are in a brightly lit box waving down to their equally hysterical audience who have just seen "The Social Network".

The film opens the next day to rave reviews and endless publicity. David Fincher is off making "The Girl with the Dragon Tattoo". Aaron Sorkin becomes the face of the film and an immediate shoo-in for an Oscar.

The Hamptons International Film Festival in October suddenly becomes a launching pad for "127 Hours", where cool Yale/NYU student James Franco appears and receives a heroic standing ovation. More Oscar buzz.

"Black Swan" also unspools there in a tiny theater as Madonna, Alec Baldwin and even Harvey Weinstein slip in the back. Darren Aronofsky, sporting the ever present cool wool scarf around his neck is hailed a genius. Natalie Portman is instantly the hot nominee for Best Actress.

Both films are sensational and movie goers go nuts, but it is "The King's Speech" that edges out the competition for The Audience Prize.

Mid-November David O. Russell and Mark Wahlberg, working together for the third time, sneak "The Fighter" in Manhattan. As their audience erupts in cheers, I tell producer/actor Wahlberg, "Clint Eastwood is going to kill himself for not directing this." Wahlberg says, "You are wrong. He turned it down because he's done it. He has seen it and he loves it." I instantly lavish my affection and praise on David O. Russell, who becomes my new Clint Eastwood. Christian Bale and Melissa Leo are hailed the supporting actors to beat.

"True Grit" directed by the Coen Brothers and also produced by Scott Rudin doesn't premiere till mid-December at the Ziegfeld as the last serious Oscar contender for Best Picture. It gallops off to box office gold.

This is the year many of the 78 million Baby Boomers go back to the theaters. Five small budget independent films become surprise hits as each exceeds $100 million.

"The Social Network" now cements its battle cry with one word; "relevance". Mark Zuckerberg lands on the cover of Time Magazine as The Person of the Year. A smart and extensive ad campaign positions the film in the lead. Critics and pundits proclaim the race is over. "The Social Network" is the clear winner. Everyone goes on holiday.

This is probably the only time in Harvey Weinstein's life that he is caught off guard. He quickly mobilizes an inner team of 15 and conducts strategy meetings 7 days a week, including Christmas. They become like a Chinese Restaurant...always open. A generational war is in full swing. Harvey screens his film for the older voters. Everything is done by the books. Budgets are limited. He sends screenwriter David Seidler and Tom Hoooper to every corner of the country doing q+a's till they are blue in the face from "finding their voice." SAG voters begin seeing the film 2 and 3 times.

In January the Golden Globes voted on by about 88 foreign journalists gives Best Drama to "The Social Network", Best Director to David Fincher and Best Screenplay to Aaron Sorkin. Their film is still perceived as the Oscar winner.

Team Weinstein underestimates their hard work and is in shock when "The King's Speech" wins the PGA in L.A. Harvey doesn't even attend and is working in Sundance. They are equally surprised when Tom Hooper wins the DGA and the actors win the SAG Ensemble. The BAFTAs reinforced the lead. They are now the front runner. It takes the media a few weeks to catch on.

The Daily Mail announces Her Royal Highness, Queen Elizabeth has enjoyed a private screening of "The King's Speech" and is "moved" by the film. With no proof the Queen has actually seen the film, the Weinstein Company sends out a global press release thanking her Majesty for the endorsement. They also acknowledge Prime Minister David Cameron's private Christmas screening.

On Oscar night, it isn't until Hilary Swank surprisingly yells out Hooper's name for Best Director that Harvey's gang finally realizes they are getting the Oscar for Best Picture. The King has spoken.

Friday, February 24th
Mid-day, I arrive at The Beverly Hills Hotel, where I have stayed for thirty years. As the housekeepers unpack my bags upstairs I peek into the Polo Lounge and find icon Warren Beatty in a booth. He motions me over to meet an Egyptian fashion editor from Cairo. I say, "Warren, you are a little late to visit Cairo." I tell him I'm rooting for Annette and love her film "The Kids Are All Right". Warren tells me "The Social Network" will win.

This year I am two days late arriving to Oscar weekend. I am now shown to a very very very small room, the size of a broom closet. Uncharacteristically, I have a slight melt down. I am moved. The housekeepers run down the hall with my clothes flying. I calm down. The hotel is sold out. I get someone else's room. Another poor schmuck checking in downstairs will get the broom closet.

It is cold, grey and rainy. Taffata, organdy and embroidered silk evening clothes hang in my closet. I stay in my sweaters and fur coat and head to Arianna Huffington's Mediterranean house in Beverly Hills where Wendi Murdoch and Arianna are hosting a party for Tom Freston's wife, the beautiful blond Kathy. The book is called "Veganist: Lose Weight, Get Healthy, Change the World. A perfect book for Monks.

Arianna has just sold the Huffington Post for to AOL to $315 million dollars and rumored to have personally landed around $20 million. She is euphoric as she greets Nicole Kidman and Keith Urban at the door. Other drenched power players ushered in under umbrellas include Disney's Bob Iger and wife Willow Bay, Fox's Jim Gianopulos, Candice Bergen and journalist daughter Chloe Malle, Google's Eric Schmidt, Oliver Stone avoiding questions about Charlie Sheen and escorting his daughter Tara, Moby, Jamie Niven, Brian Grazer, Vivi Nevo, Tracey Ullman, CBS's Les Moonves and Julie Chen, Rob Reiner, Paramount's Brad Grey and fiancé Cassandra Marc and Jeff Bezos. Hors d'oeuvres include pigs in blankets, a food group not mentioned in Kathy's book.

The party action migrates to UTA Jim Burkus's home in the neighborhood for "True Grit's" Ethan and Joel Coen. I pass Ron Howard on the way in and he says, "Keep me on your list." Is he kidding? Sunrise and Mark Ruffalo, Tim Robbins, Focus Feature's James Shamus, Nancy Meyers and John Goldwyn mingle. Adorable Hallie Steinfeld is there with her parents. I am trying to fix her up with Justin Bieber. She giggles, "Peg, I am only 14."

Hunky Josh Brolin tells me he is coming to New York in March to shoot two new films. He is working on producing and starring in "The Hunchback of Notre Dame" with Tim Burton as a future project.

I am now inches away, face to face with Harrison Ford and stupidly tell him I love him in "Morning Glory". He is looking at me in utter disbelief and I will not shut up. A gorgeous guy is also inches away in a hat, glasses, jacket, layered sweater and scarves. I whisper to Harrison, "That looks just like Johnny Depp." Harrison rolls his eyes and reluctantly introduces me to his friend Johnny Depp. I babel a bit about his great work and run for cover to a corner next to my buddy, Jerry Bruckheimer. Jerry introduces me to the wives, Vanessa Paradis and Calista Flockhart. I bore them with girly chit-chat and realize it's time to get out of there.

I head over to the CAA/Bryan Lourd "Friday Night Party". Torrential rains and horrific winds cause a traffic jam that makes it impossible to get near the house. Cell phones do not work. The world's most famous faces cower under black umbrellas and make a run for it.

Bryan Lourd and Bruce Bozzi receive friends at the door all night. Inside Uma tells me she finally moved into a doorman building in New York after being terrorized by stalkers for years. Talented, Ben Walker talks about "Abraham Lincoln: Vampire Hunter" he is about to shoot as his fiancé Mamie Gummer looks sexy shivering in a white satin gown. Producer Jon Kilik mentions he oversees a new cut of Julian Schnabel's "Miral" to be released in March. Bennett Miller, standing with Kristin Gore says Sony loves his new film "Moneyball" and Brad Pitt is terrific. (When is Brad Pitt not terrific?) Sandy Gallin tells me he has an actual job decorating Jeffrey Katzenberg's home and he has never been happier. I congratulate Barry Levinson's son, Sam, a director, for winning the writing award at Sundance for his first film, "Another Happy Day" which is inspired by his family.

Also seen floating around are, Taylor Swift and Jake Gyllenhaal, but not together, Sean Penn, Tom Curise and Katie Holmes, Anderson Cooper, Hilary Swank, Kelly Ripa, Carrie Fisher, Bruce Weber, Sean Combs, Paul Haggis, Marisa Tomei, Jay Roach, Kate Beckinsale, Demi Moore and Ashton Kutcher, Kate Hudson, Gerard Butler, Leo DiCaprio and Bar Refaeli, Renee Zellweger with Bradley Cooper, Biutiful director Alejandro Gonzalez-Inarritu, Kathryn Bigelow and Mark Boal, Ellen Barkin who is headed to Broadway in "The Normal Heart" this spring and CAA's Kevin Huvane, Richard Lovett and Hylda Quealy.

Busy Bruce Cohen who is producing Sunday's awards broadcast tries to get his car to leave. Limo lock is at a standstill. Nothing is moving outside. Two hundred swells become party prisoners and resign to just having an absolute ball till 5:00am. Once again, this is the most star studded party in town.

Saturday, February 26th, 2011

The sun comes up and dries up all the land. IAC chairmen and owner of The Newsweek/Daily Beast Barry Diller and his designer wife Diane Von Furstenberg host their annual lunch for Graydon Carter in their Coldwater Canyon home. Barry introduces me to his star guest, Governor Jerry Brown, just elected to his third (nonconsecutive) term as California Governor. Diane's children, Alex and Tatiana, along with their children comprise three generations of guests, which makes this party so special.

Like last year, enormous clear plastic tents are erected on the hill near the house. Long wooden picnic tables covered with yellow flowers sit on oriental rugs, covering the soggy ground. Terrines of hot soup, platters of sausages, fried chicken and salads are beautifully arranged on an endless buffet. Everyone wears winter clothes; comfy sweaters and sensible shoes. I arrive in a fur coat.

Barry and Diane's loyal friends have been coming to this party for over fifteen years. Everybody knows everybody and it doesn't matter if you have a hit film or TV show this season. Oprah Winfrey kisses David Geffen, casually chats with former Disney CEO Michael Eisner and current Sony chief Sir Howard Stringer. Brett Ratner arrives with his house guest Jean Pigozzi who is allowed to photograph everyone. Graydon greets people with wife Anna and Fran Lebowitz by his side.

Ingrid Sischy and Sandy Brant, Rupert Murdoch, Ron Meyer, Bryan Lourd Francesco Clemente with his twin boys and Tom Ford chat each other up. People watching include the pregnant Victoria and David Beckham with Lynn Wyatt, Liv Tyler, Vincent Gallo, Eva Longoria, Larry Gagosian and Shala Monroque, Ben Silverman, Debbie and Allen Grubman, Tobias Meyer and Mark Fletcher and Stephen Gaghan and Mini Mortimer wearing her oversized cat glasses.

Bruce Cohen has invited me to the Oscar broadcast rehearsal. This is a special honor. There are metal barricades leading up to the credentials trailer. High-tech security includes photos and computer background checks. The only thing they don't do is pat me down and ask for fingerprints. Once inside the Kodak Theater's massive auditorium, I find a seat next to Bruce's proud parents. I watch Josh Brolin and Javier Bardem come out in white dinner jackets and flub their lines as they pretend to present Best Adapted Screenplay and Best Original Screenplay. Josh later told me at The Night Before Party that their acting methods are completely opposite. Josh says he is a quick study and is very creative and comfortable ad-libbing. Javier, whose mother tongue is Spanish, needs to have every syllable printed out, which he studies with a dialect coach. Little wiggle room for jokes. Life size photos on large cardboard plaques are taped to each nominee's chair. I try to memorize their location, so when I return Sunday I can quickly kiss them all.

Back at the Beverly Hills hotel, I slip into my gorgeous black tulle Dennis Basso cocktail dress with a plunging neck line and put on my mother's jewels. Jim Coleman takes me the Night Before Party in the hotel. This is Jeffrey Katzenberg's, 9th Annual A-lister event benefiting The Motion Picture & Television Fund where they raise $6.5 million dollars in one night. I walk right into Valentino who gives me the once over and approves my outfit. I tell him and Giancarlo Giammetti that Woody Allen's new film, "Midnight in Paris" is opening the Cannes Film Festival and they must bring the yacht. Woody is also filming all summer in Rome and I am counting on them to entertain him.

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The best and the brightest talent in town arrive at 9pm. They are Justin Bieber and his date Selena Gomez, Andrew Garfield, Jude Law, Vera Farmiga, Armie Hammer, Jennifer Lawrence, Kevin Spacey, Charlize Theron, Anne Hathaway, Hailee Steinfield,Taylor Hackford and Helen Mirren, Scarlett Johansson, Michelle Williams, Isla Fischer and Sasha Baron Cohen, Jane Fonda after her play, "33 Variations", Melania and Donald Trump whom I introduce to David O. Russell as The Trumpster gushes about "The Fighter". Donald offers me a ride home on his plane. He is leaving in ten minutes. Too bad James Franco didn't know because he is presently sitting on a commercial flight back to school, skipping his own after party. Social standings of the rest of the guests are determined by half hour increments. Every other person previously mentioned in the story is here. VF's Beth Kseniak and Matt Ullian tell me the list is cut down to 800 this year.

At 11:30pm there is another celebrity migration up the hill to Madonna manager Guy Oseary's house. One should note that earlier in the evening Madonna came down the hill to pose in a risqué outfit with daughter Lourdes in front of the green hedge. Madonna and co-host Demi Moore are able to lure the crème de la crème with the promise of fabulous music, dancing and no cameras. Those reported on their dance floor include Ryan Phillippe with Amanda Syedfried, who were making out all night and Phillippe's ex-wife Reese Witherspoon and new fiancé Jim Toth. They pregnant Natalie Portman and choreographer Benjamin Millepied, Mick Jagger, Tom Hanks, Sean Penn, Ralph Feinnes, Mila Kunis, Cameron Diaz, Gwyneth Paltrow and Renee Zellweger and Bradley Cooper boogie til dawn.

A winner's work is never done. Colin Firth, Tom Hooper and David Seidler show up at 4:30am at The Four Seasons Hotel for a live broadcast on The Today Show with Meredith Vieira. Functioning on an adrenalin rush, they are back at the Kodak Theater with Geoffrey Rush to appear on Oprah's live broadcast. Leave it to Oprah to get the king's last words.

-----Original Message-----
From: Peggy Siegal
Sent: Friday, March 04, 2011 6:12 PM
To: Stephanie
Subject: Oscar diary

Send to jeffrey

Omar Quadhafi is hunkering down in Tripoli giving press interviews denying that rebels are taking over Eastern Libya. Oil prices are shooting over one hundred dollars a barrel. The US government is on the verge of a shut down. These are not the top secret opening lines to Aaron Sorkin's new script, but the global headlines of a world spinning out of control. I head to Los Angeles like an overdressed lemming to attend the 83rd Academy Awards and attempt to make sense of artists thrust into combat.

For the second year nearly 6,000 Academy members have nominated 10 films and the battle is down to two. The beloved timeless classic, "The King's Speech" marches into the arena as the front runner, but passionate supporters of the brilliant edgier (and critics darling) "The Social Network" have not conceded. The ballots are counted, the party invites are out and still the feelings are raw. Filmmakers are exhausted from campaigning.

At Bryan Lourd's famous star studded party Sony Classics' Co-President Michael Barker announces to me he has taken a random sampling of voters in the room. He says, "There will be a 'Social Network' upset at the Kodak Theater." Shear panic radiates from my every pore as he says, "I am joking." It's like color war at summer camp.

Woody Allen and George Lucas tell me they are no longer members of the Academy because pitting artists against each other to determine the quality of their work is insane. They are right.

My event and publicity company is considered "Switzerland" by the studios, as we help every filmmaker to present and position his work. This year I am somewhat emotionally sucked in.

In 2005 I meet the unknown 32-year-old English director Tom Hooper on his first film for HBO,"Elizabeth I". The Emmy award winning movie stars Helen Mirren, who takes credit for discovering him directing English television. Helen later wins her Oscar for portraying Queen Elizabeth in "The Queen". Queen Elizabeth is the daughter of King George VI portrayed by Oscar winner Colin Firth in "The King's Speech".

I also become Hooper's champion encouraging many to see his early work including his herculean 10 hour HBO mini-series "John Adams" produced by Tom Hanks.

Six years later at the Telluride Film Festival Tom Hooper is bathing in the glory of a hysterical standing ovation with Colin Firth and Geoffrey Rush at the very first screening of "The King's Speech." Surprisingly,

this drama's subtle humor gets big laughs leading up to its emotional ending.

Within two weeks, at The Toronto Film Festival, Harvey Weinstein is now standing with his filmmakers witnessing the same reaction. The film wins The Audience Prize. Their strategy is to say nothing. Do nothing. They have a possible Oscar winner. Four out of five past Best Pictures have premiered in Toronto.

Cut to New York City at the end of September. It's the opening night at The Film Society of Lincoln Center. One of America's most important and prolific producers Scott Rudin, along with Jesse Eisenberg, Andrew Garfield and Aaron Sorkin are in a brightly lit box waving down to their equally hysterical audience who have just seen "The Social Network".

The film opens the next day to rave reviews and endless publicity. David Fincher is off making "The Girl with the Dragon Tattoo". Aaron Sorkin becomes the face of the film and an immediate **shoo-in** for an Oscar.

The Hamptons International Film Festival in October suddenly becomes a launching pad for "127 Hours", where cool Yale/NYU student James Franco appears and receives a heroic standing ovation. More Oscar buzz.

"Black Swan" also unspools there in a tiny theater as Madonna, Alec Baldwin and even Harvey Weinstein slip in the back. Darren Aronofsky, sporting the ever present cool wool scarf around his neck is hailed a genius. Natalie Portman is instantly the hot nominee for Best Actress.

Both films are sensational and movie goers go nuts, but it is "The King's Speech" that edges out the competition for The Audience Prize.

Mid-November David O. Russell and Mark Wahlberg, working together for the third time, sneak "The Fighter" in Manhattan. As their audience erupts in cheers, I tell producer/actor Wahlberg, "Clint Eastwood is going to kill himself for not directing this." Wahlberg says, "You are wrong. He turned it down because he's done it. He has seen it and he loves it." I instantly lavish my affection and praise on David O. Russell, who becomes my new Clint Eastwood. Christian Bale and Melissa Leo are hailed the supporting actors to beat.

"True Grit" directed by the Coen Brothers and also produced by Scott Rudin doesn't premiere till mid-December at the Ziegfeld as the last serious Oscar contender for Best Picture. It gallops off to box office gold.

This is the year many of the 78 million Baby Boomers go back to the theaters. Five small budget independent films become surprise hits as each exceeds $100 million.

"The Social Network" now cements its battle cry with one word; "relevance". Mark Zuckerberg lands on the cover of Time Magazine as The Person of the Year. A smart and extensive ad campaign positions the film in the lead. Critics and pundits proclaim the race is over. "The Social Network" is the clear winner. Everyone goes on holiday.

This is probably the only time in Harvey Weinstein's life that he is caught off guard. He quickly mobilizes an inner team of 15 and conducts strategy meetings 7 days a week, including Christmas. They become like a Chinese Restaurant...always open. A generational war is in full swing. Harvey screens his film for the older voters. Everything is done by the books. Budgets are limited. He sends screenwriter David Seidler and Tom Hoooper to every corner of the country doing q+a's till they are blue in the face from "finding their voice." SAG voters begin seeing the film 2 and 3 times.

In January the Golden Globes voted on by about 88 foreign journalists gives Best Drama to "The Social Network", Best Director to David Fincher and Best Screenplay to Aaron Sorkin. Their film is still perceived as the Oscar winner.

Team Weinstein underestimates their hard work and is in shock when "The King's Speech" wins the PGA in L.A. **Harvey doesn't even attend and is working in Sundance.** They are equally surprised when Tom Hooper wins the DGA and the actors win the SAG Ensemble. The BAFTAs reinforced the lead. They are now the front runner. It takes the media a few weeks to catch on.

The Daily Mail announces Her Royal Highness, Queen Elizabeth has enjoyed a private screening of "The King's Speech" and is "moved" by the film. With no proof the Queen has actually seen the film, the Weinstein Company sends out a global press release thanking her Majesty for the endorsement. They also acknowledge Prime Minister David Cameron's private Christmas screening.

On Oscar night, it isn't until Hilary Swank surprisingly yells out Hooper's name for Best Director that Harvey's gang finally realizes they are getting the Oscar for Best Picture. **The King has spoken.**

Friday, February 24th
Mid-day, I arrive at The Beverly Hills Hotel, where I have stayed for thirty years. As the housekeepers unpack my bags upstairs I peek into the Polo Lounge and find icon Warren Beatty in a booth. He motions me over to meet an Egyptian fashion editor from Cairo. I say, "Warren, you are a little late to visit Cairo." **I tell him I'm rooting for Annette and love her film "The Kids Are All Right". Warren tells me "The Social Network" will win.**

This year I am two days late arriving **to** Oscar weekend. I am now shown to a very very very small room, the size of a broom closet. Uncharacteristically, I have a slight melt down. I am moved. The housekeepers run down the hall with my clothes flying. I calm down. The hotel is sold out. I get someone else's room. Another poor schmuck checking in downstairs will get the broom closet.

It is cold, grey and rainy. Taffata, organdy and embroidered silk evening clothes hang in my closet. **I stay in my sweaters and fur coat and head to Arianna Huffington's Mediterranean house in Beverly Hills where Wendi Murdoch and Arianna are hosting a party for Tom Freston's wife, the beautiful blond Kathy. The book is called "Veganist: Lose Weight, Get Healthy, Change the World. A perfect book for Monks.**

Arianna has just sold the Huffington Post for to AOL to $315 million dollars and rumored to have personally landed around $20 million. She is euphoric as she greets Nicole Kidman and Keith Urban at the door. Other drenched power players ushered in under umbrellas include Disney's Bob Iger and wife Willow Bay, Fox's Jim Gianopulos, Candice Bergen and journalist daughter Chloe Malle, Google's Eric Schmidt, Oliver Stone avoiding questions about Charlie Sheen and escorting his daughter Tara, Moby, **Jamie Niven,** Brian Grazer, Vivi Nevo, Tracey Ullman, CBS's Les Moonves and Julie Chen, Rob Reiner, Paramount's Brad Grey and fiancé Cassandra Marc and Jeff Bezos. Hors d'oeuvres include pigs in blankets, a food group not mentioned in Kathy's book.

The party action migrates to UTA Jim Burkus's home in the neighborhood for **"True Grit's"** Ethan and Joel Coen. I pass Ron Howard on the way in and he says, "Keep me on your list." Is he kidding? Sunrise and Mark Ruffalo, Tim Robbins, Focus Feature's James Shamus, Nancy Meyers and John Goldwyn mingle. **Adorable** Hallie Steinfeld is there with her parents. I am trying to fix her up with Justin Bieber. She giggles, "Peg, I am only 14."

Hunky Josh Brolin tells me he is coming to New York in March to shoot two new films. He is working on producing and starring in "The Hunchback of Notre Dame" with Tim Burton as a future project.

I am now inches away, face to face with Harrison Ford and stupidly tell him I love him in "Morning Glory". He is looking at me in utter disbelief and I will not shut up. A gorgeous guy is also inches away in a hat, glasses, jacket, layered sweater and scarves. I whisper to Harrison, "That looks just like Johnny Depp." Harrison rolls his eyes and reluctantly introduces me to his friend Johnny Depp. I babel a bit about his great work and run for cover to a corner next to my buddy, Jerry Bruckheimer. Jerry introduces me to the wives, Vanessa Paradis and Calista Flockhart. **I bore them with girly chit-chat and realize it's time to get out of there.**

I head over to the CAA/Bryan Lourd "Friday Night Party". **Torrential rains and horrific winds cause a traffic jam that makes it impossible to get near the house.** Cell phones do not work. The world's most famous faces cower under black umbrellas and make a run for it.

Bryan Lourd and Bruce Bozzi receive friends at the door all night. Inside Uma tells me she finally moved into a doorman building in New York after being terrorized by stalkers for years. Talented, Ben Walker talks about "Abraham Lincoln: Vampire Hunter" he is about to shoot as his fiancé Mamie Gummer looks sexy shivering in a white satin gown. Producer Jon Kilik mentions he oversees a new cut of Julian Schnabel's "Miral" to be released in March. Bennett Miller, **standing with Kristin Gore** says Sony loves his new film "Moneyball" and Brad Pitt is terrific. (When is Brad Pitt not terrific?) Sandy Gallin tells me he has an actual job decorating Jeffrey Katzenberg's home and he has never been happier. I congratulate Barry Levinson's son, Sam, a director, for winning the writing award at Sundance for his first film, "Another Happy Day" which is inspired by his family.

Also seen floating around are, Taylor Swift and Jake Gyllenhaal, but not together, Sean Penn, Tom Curise and Katie Holmes, Anderson Cooper, Hilary Swank, Kelly Ripa, Carrie Fisher, Bruce Weber, Sean Combs, Paul Haggis, Marisa Tomei, Jay Roach, Kate Beckinsale, Demi Moore and Ashton Kutcher, Kate Hudson, Gerard Butler, Leo DiCaprio and Bar Refaeli, Renee Zellweger with Bradley Cooper, Biutiful director Alejandro Gonzalez-Inarritu, Kathryn Bigelow and Mark Boal, Ellen Barkin who is headed to Broadway in "The Normal Heart" this spring and CAA's Kevin Huvane, Richard Lovett and Hylda Queally.

Busy Bruce Cohen who is producing Sunday's awards broadcast tries to get his car to leave. Limo lock is at a standstill. Nothing is moving

outside. Two hundred swells become party prisoners and resign to just having an absolute ball till 5:00am. Once again, this is the most star studded party in town.

Saturday, February 26th, 2011

The sun comes up and dries up all the land. IAC chairmen and owner of The Newsweek/Daily Beast Barry Diller and his designer wife Diane Von Furstenberg host their annual lunch for Graydon Carter in their Coldwater Canyon home. Barry introduces me to his star guest, Governor Jerry Brown, just elected to his third (nonconsecutive) term as California Governor. Diane's children, Alex and Tatiana, along with their children comprise three generations of guests, which makes this party so special.

Like last year, enormous clear plastic tents are erected on the hill near the house. Long wooden picnic tables covered with yellow flowers sit on oriental rugs, covering the soggy ground. Terrines of hot soup, platters of sausages, fried chicken and salads are beautifully arranged on an endless buffet. Everyone wears winter clothes; comfy sweaters and sensible shoes. I arrive in a fur coat.

Barry and Diane's loyal friends have been coming to this party for over fifteen years. Everybody knows everybody and it doesn't matter if you have a hit film or TV show this season. Oprah Winfrey kisses David Geffen, casually chats with former Disney CEO Michael Eisner and current Sony chief Sir Howard Stringer. Brett Ratner arrives with his house guest Jean Pigozzi who is allowed to photograph everyone. Graydon greets people with wife Anna and Fran Lebowitz by his side.

Ingrid Sischy and Sandy Brant, Rupert Murdoch, Ron Meyer, Bryan Lourd Francesco Clemente with his twin boys and Tom Ford chat each other up. People watching include the pregnant Victoria and David Beckham with Lynn Wyatt, Liv Tyler, Vincent Gallo, Eva Longoria, Larry Gagosian and Shala Monroque, Ben Silverman, Debbie and Allen Grubman, Tobias Meyer and Mark Fletcher and Stephen Gaghan and Mini Mortimer wearing her oversized cat glasses.

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An hour later there is a migration to the famous Vanity Fair party hosted by Graydon Carter at the Sunset Tower Hotel owned by Jeff Klein. One celebrity after another poses in front of the green hedge standing in the middle of the circular Vanity Fair logo to record their devotion and support to Graydon and the magazine.

There's a hierarchy of arrival times. The inner circle of Graydon's 150 best friends attend a seated dinner and viewing of the show at 5pm. They include Barry Diller and Diane Von Furstenberg, Francis Ford Coppola, Jon Hamm and Jennifer Westfeldt, Betsey Bloomingdale, Tory Burch and Lyor Cohen, Tom Ford, Sandy Gallin, Mitch Glazer and Kelly Lynch, Carolina and Reinaldo Herrera, L'Wren Scott and Sir Mick Jagger, Naomi Watts and Live Schreiber, Wendi Stark, Judd Apatow, Jackie and Joan Collins, George Hammilton, Donna Karan and Steve Martin.

The best and the brightest talent in town arrive at 9pm. They are Justin Bieber and his date Selena Gomez, Andrew Garfield, Jude Law, Vera Farmiga, Armie Hammer, Jennifer Lawrence, Kevin Spacey, Charlize Theron, Anne Hathaway, Hailee Steinfield,Taylor Hackford and Helen Mirren, Scarlett Johansson, Michelle Williams, Isla Fischer and Sasha Baron Cohen, Jane Fonda after her play, "33 Variations", Melania and Donald Trump whom I introduce to David O. Russell as The Trumpster gushes about "The Fighter". Donald offers me a ride home on his plane. He is leaving in ten minutes. Too bad James Franco didn't know because he is presently sitting on a commercial flight back to school, skipping his own after party. Social standings of the rest of the guests are determined by half hour increments. Every other person previously mentioned in the story is here. VF's Beth Kseniak and Matt Ullian tell me the list is cut down to 800 this year.

At 11:30pm there is another celebrity migration up the hill to Madonna manager Guy Oseary's house. One should note that earlier in the evening Madonna came down the hill to pose in a risqué outfit with daughter Lourdes in front of the green hedge. Madonna and co-host Demi Moore are able to lure the crème de la crème with the promise of fabulous music, dancing and no cameras. Those reported on their dance floor include Ryan Phillippe with Amanda Syedfried, who were making out all night and Phillippe's ex-wife Reese Witherspoon and new fiancé Jim Toth. They pregnant Natalie Portman and choreographer Benjamin Millepied, Mick Jagger, Tom Hanks, Sean Penn, Ralph Feinnes, Mila Kunis, Cameron Diaz, Gwyneth Paltrow and Renee Zellweger and Bradley Cooper boogie til dawn.

A winner's work is never done. Colin Firth, Tom Hooper and David Seidler show up at 4:30am at The Four Seasons Hotel for a live broadcast on The Today Show with Meredith Vieira. Functioning on an adrenalin rush, they are back at the Kodak Theater with Geoffrey Rush to appear on Oprah's live broadcast. Leave it to Oprah to get the king's last words.

The Glory of Gold

Über publicist **Peggy Siegal** has been attending the Academy Awards for three decades—not to mention the oodles of parties and sensational events leading up to the ceremony—and chronicling her escapades with stars and star-makers for *AVENUE* has become a tradition. This year, she sets the stage for the big night with the behind-the-scenes scoop on the fierce competition that ends when Oscar is presented. Here, she reports on the Hollywood glamour, excitement and social shenanigans, including celebrating with Colin Firth, Jesse Eisenberg, Elton John, Oprah Winfrey and many more.

Peggy Siegal

photographs by PATRICK MCMULLAN

Qaddafi is hunkering down in Tripoli, giving press interviews, denying that rebels are taking over Eastern Libya. Oil prices are shooting up over one hundred dollars a barrel. The U.S. government is on the verge of a shutdown. These are not the top-secret opening lines of **Aaron Sorkin**'s new script, but the global headlines of a world spinning out of control as I head to Los Angeles like an overdressed lemming to attend the 83rd Academy Awards and attempt to make sense of artists thrust into combat.

For the second year, nearly 6,000 Academy members have nominated 10 films and the battle seems to be pared down to 2. The beloved instant classic, *The King's Speech*, marches into the arena as the frontrunner, but passionate supporters of the edgier (critics' darling) *The Social Network* have not conceded. The ballots are counted, the party invites are out and still the feelings are raw. Nominees are exhausted from campaigning.

Woody Allen and **George Lucas** tell me they are no longer members of the Academy because pitting artists against each other to determine the quality of their work is insane. They are right. My event and publicity company is considered Switzerland by the studios, as we help every filmmaker to present his work. However, this year, against my better judgment, I am somewhat emotionally sucked in.

In 2005, I met the unknown 32-year-old English director **Tom Hooper** on his first film for HBO, *Elizabeth I* starring **Helen Mirren**. Helen later wins an Oscar for portraying Queen Elizabeth in *The Queen*. Queen Elizabeth is the daughter of King George VI, portrayed by Oscar-winner **Colin Firth** in *The King's Speech* directed by Hooper. No degrees of separation.

At the Telluride Film Festival, Tom Hooper bathed in the glory of a hysterical standing ovation alongside Colin Firth and **Geoffrey Rush** at the very first public screening of that film. Two weeks later at The Toronto Film Festival, **Harvey Weinstein** stood with his filmmakers witnessing the same reaction. The film won The Audience Prize. Their strategy was to say nothing, do nothing. They have a possible Oscar winner—four out of five past Best Pictures have premiered in Toronto.

Cut to New York City at the end of September. It's opening night at The Film Society of Lincoln Center. One of America's most important and prolific producers, **Scott Rudin**, along with **Jesse Eisenberg**, **Andrew Garfield** and **Aaron Sorkin**, are in a brightly lit box waving down to their equally hysterical audience who have just seen *The Social Network*. The film opens the next day to rave reviews and endless publicity. **David Fincher** is off making *The Girl with the Dragon Tattoo*. **Aaron Sorkin** becomes the face of the film and an immediate shoo-in for the adapted screenplay Oscar.

The Hamptons International Film Festival in October suddenly becomes a launching pad for *127 Hours*, where star-cum-Yale/NYU student **James Franco** appears. More Oscar buzz. Producer/director **Danny Boyle** (Oscar winner for *Slumdog Millionaire*) stays in London all fall directing the play *Frankenstein*. *Black Swan* also unspools there in a tiny theater as **Madonna**, **Alec Baldwin** and **Harvey Weinstein** slip in the back. **Darren Aronofsky** is hailed a genius. **Natalie Portman** is instantly the hot nominee for Best Actress. Both films are sensations, but it's *The King's Speech* that wins The Audience Prize.

Mid-November: **David O. Russell** and **Mark Wahlberg** sneak *The Fighter* in Manhattan. As their audience erupts in cheers, I tell producer/actor Wahlberg, "**Clint Eastwood** is going to kill himself for not directing this." He says, "You're wrong. He turned it down because he's done it. He's seen it and he loves it." David O. Russell becomes my new Clint Eastwood. **Christian Bale** and **Melissa Leo** are hailed the supporting actors to beat.

True Grit, directed by the **Coen Brothers** and also produced by **Scott Rudin**, finally throws its cowboy hat in the ring in mid-December at the Ziegfeld as the last serious Oscar contender for Best Picture. It gallops off to box office gold.

The Social Network now cements its battle cry with one word: relevance. **Mark Zuckerberg** lands on the cover of *Time* Magazine as "Person of the Year." A smart and extensive ad campaign positions the film in the lead. Critics and pundits proclaim the race is over. Everyone goes on holiday.

This is one of the few times in Harvey Weinstein's life that he's caught off guard. He quickly mobilizes an inner team of 15 and conducts strategy meetings 7 days a week, including Christmas. They're like a Chinese restaurant: always open. He sends screenwriter **David Seidler** and Tom Hooper to every corner of the country doing Q&As until they are both blue in the face from "finding their voice." SAG voters begin seeing the film two and three times.

In January at the Golden Globes, about 88 foreign journalists give awards to *The Social Network* for Best Drama, Director and Screenplay. The film is still perceived as the Oscar winner and nobody can stop the steamroller. Only Academy voters disregard these awards.

The King's Speech wins the PGA in L.A. Everyone is totally surprised when Tom Hooper goes on to win the DGA. After a tremendous amount of hard work by team Weinstein, the actors win for the SAG Ensemble. The BAFTAs reinforced their lead; the film is now the frontrunner. It takes the media a few weeks to catch on.

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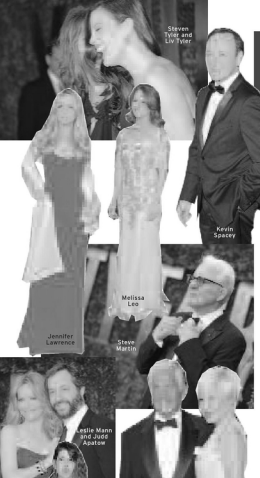


I whisper to Harrison [Ford], "That looks just like Johnny Depp." Harrison rolls his eyes and reluctantly introduces me to his friend . . . Johnny Depp.

The Daily Mail announces Her Royal Highness **Queen Elizabeth** has enjoyed a private screening of *The King's Speech* and is "moved" by the film. With no proof the Queen has actually seen the film, press agents send out a global press release thanking her Majesty for the endorsement.

FRIDAY, FEBRUARY 24

Mid-day, I arrive at The Beverly Hills Hotel. As the housekeepers unpack my bags upstairs I peek into the Polo Lounge and find **Warren Beatty** in a booth. I tell him I'm rooting for his wife, **Annette Benning**, and love her film, *The Kids Are All Right*. Warren says *The Social Network* will win.

This year I am two days late arriving to Oscar weekend. I am shown to a very, very small room—the size of a broom closet. Uncharacteristically, I have a slight melt down. I am moved. The housekeepers run down the hall with my clothes flying. The hotel is sold out, so I get someone else's room. Another unsuspecting victim checking in downstairs will get the broom closet.

It is cold, grey and rainy. Taffeta, organdy and embroidered silk evening clothes hang in my closet. I stay in my sweaters and fur coat, and head to **Arianna Huffington**'s home in Beverly Hills where she and **Wendi Murdoch** are hosting a party for **Tom Freston**'s wife, the beautiful, blonde **Kathy**. Her book is called *Veganist: Lose Weight, Get Healthy, Change the World*—perfect for monks.

Arianna has just sold the Huffington Post to AOL for $315 million dollars and is rumored to have personally landed around $20 million. She is euphoric as she greets **Nicole Kidman** and **Keith Urban** at the door. Other drenched power players include Disney's **Bob Iger** and wife **Willow Bay**, Fox's **Jim Gianopulos**, **Candice Bergen** and journalist daughter **Chloe Malle**, Google's **Eric Schmidt**, **Oliver Stone** escorting his daughter **Tara** and avoiding questions about **Charlie Sheen**, **Moby**, **Jamie Niven**, **Brian Grazer**, **Vivi Nevo**, CBS's **Les Moonves** and **Julie Chen**, **Rob Reiner**, Paramount's **Brad Grey** and fiancé **Cassandra Huysentruyt** and **Jeff Bezos**. Hors d'oeuvres include pigs in blankets—a food group not mentioned in Kathy's book.

The action migrates to UTA **Jim Burkus**' home for a party for *True Grit*'s **Ethan** and **Joel Coen**. I pass **Ron Howard** on the way in and he says, "Keep me on your list." Is he kidding? **Sunrise** and **Mark Ruffalo**, Focus Feature's **James Shamus**, **Nancy Meyers** and **John Goldwyn** mingle. Adorable **Hallie Steinfeld** is there with her parents. I am trying to fix her up with **Justin Bieber**. She giggles, "Peg, I am only 14."

I am face to face with **Harrison Ford** and stupidly tell him I love him in *Morning Glory*. He's looking at me in utter disbelief, but I will not shut up. A gorgeous guy is inches away in a hat and glasses. I whisper to Harrison, "That looks just like **Johnny Depp**." Harrison rolls his eyes and reluctantly introduces me to his friend . . . Johnny Depp. I babble a bit about his great work then run for cover in a corner next to my buddy, **Jerry Bruckheimer**.

I head over to the CAA/**Bryan Lourd**'s "Friday Night Party." Torrential rains and horrific winds cause a traffic jam that makes it impossible to get near the house. The world's most famous faces cover under black umbrellas and make a run for it. Bryan Lourd and **Bruce Bozzi** receive friends at the door all night.

Inside, **Uma Thurman** tells me she finally moved into a doorman building in New York after being terrorized by stalkers for years. **Ben Walker** talks about *Abraham Lincoln: Vampire Hunter*, which he is about to shoot, while his fiancé, **Mamie Gummer**, looks sexy shivering in a white satin gown. Producer **Jon Kilik** mentions he oversaw a new cut of **Julian Schnabel**'s *Miral*, to be released in March. **Bennett Miller**, standing with **Kristin Gore**, says Sony loves his new film, *Moneyball*, and **Brad Pitt** is terrific. (When is Brad Pitt not terrific!) **Sandy Gallin** tells me he has an actual job decorating **Jeffrey Katzenberg**'s home. I congratulate **Barry Levinson**'s son **Sam**, a director, for winning the writing award at Sundance for his first film, *Another Happy Day*.

Also seen floating around are **Taylor Swift** and **Jake Gyllenhaal**—but not together—**Sean Penn**, **Tom Cruise** and **Katie Holmes**, **Anderson Cooper**, **Hilary Swank**, **Kelly Ripa**, **Paul Haggis**, **Marisa Tomei**, **Kate Beckinsale**, **Demi Moore** and **Ashton Kutcher**, **Kate Hudson**, **Gerard Butler**, **Renee Zellweger** with **Bradley Cooper**, *Bistiful* director **Alejandro Gonzalez-Inarritu**, **Kathryn Bigelow** and **Mark Boal**, **Ellen Barkin** (who is headed to Broadway in *The Normal Heart* this spring) and CAA's **Kevin Huvane**, **Richard Lovett** and **Hylda Queally**. Sony Classic's **Michael Barker** tells me *The Social Network* will win.

Tired celebs try to go home, but limo lock is at a standstill. Cell phones don't work in the area. Two hundred swells become party prisoners and happily hang out till 5 a.m.

SATURDAY, FEBRUARY 26

Out comes the sun and dries up all the rain. IAC chairmen and owner of *Newsweek*/The Daily Beast **Barry Diller** and his wife **Diane Von Furstenberg** (with her kids **Alex** and **Tatiana**) host their 15th annual lunch for **Graydon Carter** in their Coldwater Canyon home. Barry introduces me to his star guest, Gov. **Jerry Brown**, just elected to his third (nonconsecutive) term as California governor.

Like last year, enormous clear plastic tents are erected on the hill near the house. Long wooden picnic tables sit on oriental rugs covering the soggy ground. VIPs wears winter clothes, comfy sweaters and sensible shoes. I arrive in a fur coat.

Wendi Murdoch, Kathy Freston and Arianna Huffington

Georgina Chapman

Natalie Portman

Everybody knows everybody, and it doesn't matter if you have a hit film or T.V. show this season. **Oprah Winfrey** kisses **David Geffen**, casually chats with former Disney C.E.O. **Michael Eisner** and current Sony Chief **Sir Howard Stringer** and **Rob Weisenthal**. **Brett Ratner** arrives with his houseguest **Jean Pigozzi**, who is allowed to take photographs. Graydon greets people with chic wife **Anna** by his side.

Ingrid Sischy and **Sandy Brant**, **Rupert Murdoch**, **Ron Meyer**, **Francesco Clemente** with his twin boys and **Tom Ford** chat each other up. People to watch include pregnant **Victoria** and **David Beckham** with **Lynn Wyatt**, **Fran Lebowitz**, **Larry Gagosian** and **Shala Monroque**, **Ben Silverman**, **Debbie** and **Allen**

I head over to the CAA/Bryan Lourd's "Friday Night Party." Torrential rains and horrific winds cause a traffic jam that makes it impossible to get near the house. The world's most famous faces cower under black umbrellas and make a run for it.

Hilary Swank

Cameron Diaz

Brian Grazer and Jeff Bezos

Tom Ford

Grubman, Sotheby's **Tobias Meyer** and **Mark Fletcher** and **Stephen Gaghan** and **Mini Mortimer** wearing her oversized cat glasses.

Bruce Cohen has invited me to the Oscar broadcast rehearsal. Inside the Kodak Theater's massive auditorium, I find a seat next to his proud parents. I watch **Josh Brolin** and **Javier Bardem** come out in white dinner jackets and flub their lines as they pretend to present Best Adapted Screenplay and Best Original Screenplay. Josh will later tell me that their acting methods are completely opposite: he's a quick study and is very creative and comfortable ad-libbing; Javier, whose mother tongue is Spanish, likes to have every syllable printed out to study with a dialect coach. Life-size photos on cardboard plaques are taped to each nominee's chair. I memorize their location so when I return Sunday I can quickly kiss them all.

Back at the Beverly Hills hotel I slip into my black tulle **Dennis Basso** cocktail dress with a plunging neckline and put on my mother's jewels. **Jim Coleman** takes me to the "Night Before Party" in the hotel. This is *Jeffrey Katzenberg*'s 9th annual A-lister event benefiting The Motion Picture & Television Fund where they raise $6.5 million dollars in 1 night. I walk into **Valentino**, who gives me an approving once-over. I tell him and **Giancarlo Giammetti** that **Woody Allen**'s new film, *Midnight in Paris*, is opening the Cannes Film Festival and they must bring the yacht.

Elton John and **David Furnish** join our conversation so of course we ask for intimate details about baby **Zachary**. I segue over to **Amy Adams**, who, like them, mentions she hates leaving her baby in the hotel room. Next stop is **Kate Capshaw** in a black bowler hat chatting with **Steven Spielberg**'s god-daughter, **Gwyneth Paltrow**. I have known Steven for years (in 1982 I was a publicist on *E.T.*). I now tell him I'm going to the Lincoln Center opening of *War Horse* with **Kathy Kennedy** and **Frank Marshall** and cannot wait to see his movie version.

I meet sweet **Jennifer Aniston**, her new haircut and her perfect little body. Her date tells me her secret is a half-hour on the treadmill everyday—such an understatement. I tell **Jesse Eisenberg** I was on his plane home from the Baftas last week, but he was hiding under his hoodie. He says innocently, "You should have said 'hello.' I always cover my head because I think my curls make me look like a girl."

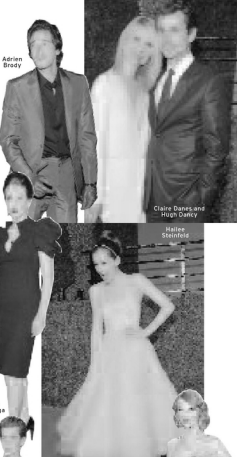
The charity gives us a coupon booklet redeemable at various booths. Rich people run around like lunatics, collecting gifts for their housekeepers. Among the shoppers are **Steven** and **Heather Mnuchin**, Viacom's **Deborah** and **Philippe Dauman**, **Tamara Mellon**, **Christine Taylor** and **Ben Stiller**, **Cate Blanchet**, **Susan** and **Robert Downey Jr.** and **Debra** and **Hugh Jackman**.

Next stop is The Weinstein Company's party at the Soho House sponsored by Montflanc. Long gone are the funky Miramax Saturday night soirees where nominees spoofed their own films in homemade costumes and ad-libbed hilarious skits. No more grown men dressed as **Anna Paquin** playing the piano in hopes of winning a Max Award.

As I come in, a 400-pound gorilla refuses to let me on the elevator. Once on, I see **Jennifer Lopez** in the corner and remind her we met on **Len Blavatnik**'s yacht in Cannes. She graciously pretends to remember me. Her manager, **Benny Medina**, is kicking me.

I slip into Colin Firth's booth to have a tête-à-tête with him and his wife **Livia Giuggioli**. Jokingly, I suggest he say "I'm speechless" when he wins. Colin patiently assures me many people, far more clever than I, thought of this. He then says that others are waging bets on whether he might subconsciously stutter. I grill him about his wardrobe, assuming he will be wearing a new **Tom Ford** tuxedo. He tells me both he and Ford will be in older Ford models. I tell him I made rich-but-thrifty **Charles Ferguson**, director of *Inside Job*, spend $6,000 dollars for a new Tom Ford tux.

In the back room, Jennifer Lopez is now seated with Weinstein's wife, **Georgina Chapman**. **Helena Bonham Carter**, her live-in-lover **Tim Burton** and her mother **Elena** circulate. Star power includes **Adrien Brody**, **Mary-Kate** and **Ashley Olsen**, **Cameron Diaz**, **Camilla Belle**, **Chace**



Adrien Brody

Claire Danes and Hugh Dancy

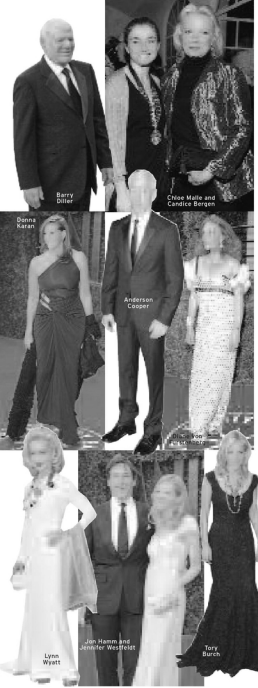
Hailee Steinfeld

Vera Farmiga

Taylor Swift

Andrew Garfield

Oliver Stone and Tara Stone



Crawford, **Claire Danes** and **Hugh Dancy**, **Darren Aronofsky**, director **John Wells**, **Kerry Washington**, **Piers Morgan**, **Rachel Zoe**, **Sean Parker**, **Zack Braff** and **Leonardo Dicaprio** with **Bar Rafaeli**. Speech filmmakers are functioning on high anxiety.

SUNDAY, FEBRUARY 27

Producer **Donna Gigliotti** is my date to the awards. We are both so nervous we arrive at the Kodak Theater at 3 p.m. and nobody is there. We are driven around for an hour. When we arrive back at the world's most famous red carpet, I guide Donna through security check-in to the extreme right to make sure we get on camera. I teach her the red carpet hustle, which is five steps forward, three steps back, one inch behind a couture-clad nominee. We greet **Kevin Huvane** as **Sandra Bullock** is talking to ABC-TV and a billion people see me wearing a black Marchesa gown. Five steps forward, three steps back, we next meet **Gwyneth Paltrow**, and I hook up the back of her dress while another billion people see me correct the fashion malfunction. Five steps forward, three steps back, we're now posing behind Nicole Kidman and Keith Urban. Our Blackberrys begin buzzing; the world has seen us.

James Franco and **Anne Hathaway** are hip hosts. This is the year of no surprises. But it isn't until **Hilary Swank** yells out Hooper's name for Best Director that Harvey's gang finally realizes they are getting the Oscar for Best Picture after all. Harvey is sitting in Spielberg's seat as Spielberg announces the win from the stage. Producers **Iain Canning**, **Emile Sherman** and **Gareth Unwin** leap up and kiss each other. Six months of grueling work have finally paid off. King George VI and Harvey Weinstein now share the journey of a single man who triumphs over adversity.

At the Governor's ball, held above the Kodak Theater, the winners triumphantly sachet around the room holding their heavy eight-pound gold statues.

An hour later there is a migration to the *Vanity Fair* party hosted by Graydon Carter at **Jeff Klein**'s Sunset Tower Hotel. The invitation features a gold hologram that transmits a radio frequency of a photo and details about the guest to *VF* staff as they arrive. The next day "Page Six" will report that the backup private security firm is run by a former Israeli operative, when in fact they are Irish Catholics from Staten Island.

There's a hierarchy of arrival times. At 5 p.m. the inner circle of Graydon's 141 best friends attend a seated dinner. They include Barry Diller and Diane von Furstenberg, **Francis Ford Coppola**, **Jon Hamm** and **Jennifer Westfeldt**, **Betsey Bloomingdale**, **Tory Burch** and **Lyor Cohen**, **Carolina** and **Reinaldo Herrera**, **L'Wren Scott** and **Sir Mick Jagger**, **Naomi Watts** and **Liev Schreiber**, **Wendi Stark**, **George Hamilton**, **Judd Apatow**, **Jackie** and **Joan Collins**, **Donna Karan** and **Steve Martin**.

The best and the brightest talent in town arrive at 9 p.m. Every single winner shows up. Also there are Justin Bieber and his date **Selena Gomez**, **Michelle Williams**, **Emma Stone**, **Steve Tyler and Liv Tyler**, **Andrew Garfield**, **Jude Law**, **Armie Hammer**, **Vera Farmiga**, **Kevin Spacey**, **Charlize Theron**, Anne Hathaway, *Winter's Bone* star-of-tomorrow **Jennifer Lawrence**, **Taylor Hackford** and **Helen Mirren**, **Scarlett Johansson**, **Isla Fischer** and **Sasha Baron Cohen**, **Tom Hanks**, **Sean Penn**, **Renee Zellweger** and **Bradley Cooper** and **Jane Fonda** after her play, *33 Variations*. I introduce **Melania** and **Donald Trump** to **David O. Russell** as The Trumpster gushes about *The Fighter*. David tells Donald he used to be a waiter/bar tender at many of Trump's parties. Donald smiles as if looking at yet another apprentice. He then offers me a ride home on his plane; he's leaving in 10 minutes. Too bad James Franco didn't know because he is presently sitting on a commercial flight back to school, skipping his own after-party. The rest of the guests' social standings are determined by half-hour increments. *VF*'s **Beth Kseniak**, **Matt Ullian** and **Jane Sarkin** tell me the list is cut down to 800 this year.

At 11:30 p.m. there is another celebrity migration up the hill to **Madonna** manager **Guy Oseary**'s house. Earlier in the evening, Madonna came down the hill to pose in a risqué see-thru outfit with daughter **Lourdes**. Madonna and co-host **Demi Moore** are able to lure the crème de la crème with the promise of dancing and no cameras.

> I introduce Melania and Donald Trump to David O. Russell . . . David tells Donald he used to be a waiter/bar tender at many of Trump's parties. Donald smiles as if looking at yet another apprentice.

MONDAY, FEBRUARY 28

A winner's work is never done. Colin Firth, Tom Hooper and David Seidler show up at 4:30 a.m. at The Four Seasons Hotel for a live broadcast on "The Today Show." Functioning on an adrenalin rush, they return to the Kodak Theater with Geoffrey Rush to appear on Oprah's live broadcast.

By the end of this year's thrilling race between two great producers—Scott Rudin and Harvey Weinstein—Facebook and Twitter are credited for aiding political justice from the streets of Cairo to Tripoli. But the British film with the most heart wins as one single human voice can still make a difference. The king has spoken. ✦

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Jeffrey Epstein's attorneys fight to keep plea discussions private

John Pacenti
2011-04-21 12:00:00 AM

Miami attorney Roy Black and two other high-profile attorneys who represented billionaire sex offender Jeffrey Epstein have asked a federal judge to prohibit two alleged victims from obtaining correspondence between the defense team and federal prosecutors who hammered out a nonprosecution agreement.

The two women identified in court papers only as Jane Doe 1 and Jane Doe 2 say the agreement should be invalidated because they were not adequately informed of the plan not to file federal charges against Epstein.

The defense attorneys' motion to intervene states the sanctity of plea talks would be undermined if U.S. District Judge Kenneth Marra in West Palm Beach allows the correspondence to be used in the third-party civil action brought by the alleged victims.

New York litigator Jay Lefkowitz and Boston criminal defense attorney Martin G. Weinberg joined Black in the motion filed April 7.

The fight over the records comes amid claims that the defense strong-armed prosecutors into a cushy deal for Epstein.

"The release of these letters and the precedent it would establish would have a severe chilling effect on the lawyers' ability to engage in candid settlement discussions with the government in future cases," the 13-page motion reads. "Indeed, to the extent such written correspondence is deemed discoverable by third parties, criminal defense attorneys and the government's lawyers alike would lose the ability to negotiate such agreements."

The alleged victims maintain evidence shows Epstein molested more than 30 girls from 2001 to 2007, luring them to his Palm Beach mansion on the pretext of giving him a massage.

As part of the nonprosecution agreement, he pleaded guilty to a state charge of soliciting sex with a minor and

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served 13 months of an 18-month sentence. He resurfaced recently in New York and has become the subject of news reports about socializing with Britain's Prince Andrew.

Personal Inquiry

The women say the nonprosecution agreement should be scuttled and Epstein should be open to federal charges because they were not adequately consulted as required under the Crimes Victims Rights Act. They seek disclosure of all correspondence between Epstein's attorneys and the government, claiming it would show prosecutors failed to meet their obligation to keep them and other victims informed.

The U.S. attorney's office argued in a 54-page response April 8 to the women's lawsuit that the law does not apply because no federal charges were filed against the financier, only a state charge.

The women were denied access to the letters in their civil lawsuit against Epstein, which was settled. The motion by Black, Lefkowitz and Weinberg said there is "no doubt" the women aim to disseminate the material to news outlets. They urge Marra to "decline the invitation to fuel the media campaign against Mr. Epstein."

Epstein has had plenty of trouble avoiding the media of late. Reports about his friendship with Prince Andrew sparked a March 20 three-page letter from Alex Acosta, U.S. attorney when the agreement was reached, to the Daily Beast online news site.

Acosta said the federal government intervened in Epstein's case at request of police because the Palm Beach state attorney's office was going to offer him a deal with no jail time. Acosta said his office secured, through the nonprosecution agreement, jail time for Epstein, his plea to a sex crime against a minor and his designation as a sex offender.

Acosta's letter said Epstein's defense team was not happy with these conditions and tried to hire private investigators to delve into the personal lives of prosecutors assigned to the case as a way of undermining the office's insistence on conditions that went beyond the state case.

"Defense counsel investigated individual prosecutors and their families, looking for personal peccadilloes that may provide a basis for disqualification," Acosta wrote.

Sources say the efforts targeted Assistant U.S. Attorneys Jeffrey Sloman and Ann Marie Villafaña. Acosta refused to remove them.

Acosta, now the law dean at Florida International University in Miami, said he had no comments beyond his letter. The U.S. attorney's office also declined to comment.

Sloman, who took over as acting U.S. attorney when Acosta became FIU's law dean, later joined the Ferraro Law Firm in Coral Gables, said only, "Alex's recollection is correct."

Black, in an interview with the Daily Business Review, denied Acosta's assertions that the Epstein defense team examined the prosecutors.

"We don't investigate prosecutors," he said. "As far as I know that wasn't done."

HOUSE_OVERSIGHT_012705

Black also denied there was any effort to pressure the U.S. attorney's office to back off Epstein.

"It is absurd to say that the target of a federal criminal investigation could put undo pressure on the United States, the government, the Department of Justice, the U.S. attorney's office and the FBI," Black said.

Weinberg, who challenged a Justice Department policy of seizing e-mail through secret subpoenas to Internet service providers, also said to his knowledge no private investigator was hired. Lefkowitz, a partner at Kirkland & Ellis in New York who drafted President George W. Bush's policy on stem cell research, did not return a phone call for comment by deadline. Black and Weinberg said they still represent Epstein.

Fodder For Litigation

The motion to intervene does not claim the letters are attorney-client privilege and makes a point of saying Epstein reserves his right to intervene individually.

Weinberg said turning the confidential correspondence over to the Jane Does would violate the federal rules of evidence and cast a chill over the criminal defense bar, which would rightly be concerned that anything they tell the government could boomerang into civil litigation against clients.

"Neither party expected or believed these letters would later become a source of information that would be used for any other purpose," Weinberg said. "We believe the issue raised before Judge Marra has importance beyond just the litigation between the government and the Jane Does."

Bradley J. Edwards, a partner with Farmer Jaffe Weissing Edwards Fistos & Lehrman in Fort Lauderdale, represents the Jane Does. He didn't want to get into his planned response to the motion to intervene but said Acosta's letter will not affect the case.

Edwards agreed with Acosta that the Palm Beach state attorney's office faltered on the Epstein case. A call to the Palm Beach State Attorney's Office spokeswoman was not returned by deadline.

"There has never been a stronger case for the state to prosecute, and the case should have been prosecuted by the state," Edwards said. "The state totally dropped the ball, but once the feds took the case over, they too unfortunately dropped the ball."

Edwards refutes Acosta's position that the U.S. attorney's office was hampered by the lack of a clear "interstate nexus" required for federal prosecution. Evidence indicates Epstein flew on his private plane out of state with the intent to engage in sex with minors and used his telephone, a means of interstate commerce, to set up his rendezvous with underage girls, Edwards said.

Edwards contends the U.S. attorney's office caved.

"They identified a bunch of victims of sexual abuse and decided to align themselves with a bad guy and keep the victims in the dark about the secretive nonprosecution agreement they were giving to Epstein," he said.

HOUSE_OVERSIGHT_012706

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& SHIPLEY P.A.
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VIA EMAIL AND U.S. MAIL

[redacted]

March 22, 2011

Robert B. Carney, Special Master
2281 Saratoga Lane
West Palm Beach, FL 33409

Re: Edwards adv. Epstein
Our File No.: 291874

Dear Judge Carney:

Attached please find the Master Contact List pursuant to your Interim Report in this matter.

Sincerely,
Dictated But Not Signed By
Jack Scarola To Expedite Delivery

JACK SCAROLA
JS/mep
Enc.

cc: Bradley J. Edwards, Esq.
Joseph L. Ackerman, Esq.
Christopher Knight, Esq.

ATTORNEYS AT LAW:

ROSALYN SIA BAKER-BARNES
*F. GREGORY BARNHART
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LAURIE J. BRIGGS
BRIAN R. DENNEY
*EARL L. DENNEY, JR.[5]
BRENDA S. FULMER
JAMES W. GUSTAFSON, JR.
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DAVID K. KELLEY, JR.
WILLIAM B. KING[7]
*DARRYL L. LEWIS[1]
*WILLIAM A. NORTON
PATRICK E. QUINLAN[3]
EDWARD V. RICCI
*DAVID J. SALES[4]
*JOHN SCAROLA
*CHRISTIAN D. SEARCY
*JOHN A. SHIPLEY III
CHRISTOPHER K. SPEED [89]
BRIAN P. SULLIVAN [2,6]
KAREN E. TERRY
*C. CALVIN WARRINER III

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STEVE M. SMITH
BONNIE S. STARK
WALTER A. STEIN

MASTER CONTACT LIST REGARDING Privilege Log – Dated 2-23-2011
Farmer, Jaffe, Weissing, Edwards, Fistos & Lehrman

CONTACT NAME	IDENTITY
Adam Horowitz	Counsel for other Epstein Victims
Adam Steinberg	Attorney RRA
Alan Garten	Donald Trump's attorney
Amy Ederi	Robert Josefsberg's daughter
Amy Swan	Expert in Epstein Case
Anthony P	RRA CLIENT
Attorneys at RRA	
Barry Stone	Attorney RRA
Bert Patton	Legal Assistant to Robert Josefsberg
Beth Williamson	Paralegal RRA
Bradley Edwards	Attorney RRA
Cara Holmes	Attorney RRA
Carl Linder	Attorney RRA
Carla Martinez	Law Clerk at RRA
Carolyn	(Legal Asst. to Jay Howell, Co-Counsel)
Carolyn Edwards	(Legal Asst. to Jay Howell, Co-Counsel)
Confidential Source	
Christina Fitch	Staff RRA
Denis Kleinfeld	Attorney RRA
D.F.	Client (Epstein Case)
Dr. Lee	Expert (Epstein Case)
Earleen Cote	Attorney
Elizabeth Kim	Paralegal RRA
Elizabeth Villar	Legal Assistant RRA
Gary Farmer	Attorney RRA
Grant Smith	Attorney RRA
Ileana Yarzabal	Prior Paralegal to Robert Josefsberg
Investigators	Investigators RRA
Jack Hill	Counsel for other Epstein Victims
Jack Scarola	Counsel for other Epstein Victims
Jacquie Johnson	Paralegal RRA
Jessica Caldwell	Attorney Critton's Assistant
Josh Roberts	Attorney
Jonathan Birkman	Attorney RRA

MASTER CONTACT LIST REGARDING Privilege Log – Dated 2-23-2011
Farmer, Jaffe, Weissing, Edwards, Fistos & Lehrman

Katherine Ezell	Counsel for other Epstein Victims
Kikka Claudio	Assistant to Attorney Jack Hill
Kendall Coffey	Special Counsel to RRA on Epstein Case
Ken Jenne	Investigators RRA
Lisa Rivera	Legal Assistant to Adam Horowitz
Litigation Team	RRA attorneys and staff
Marc Nurik	Attorney RRA
Margaret Berk	Legal Assistant to Spencer Kuvin
Maribel Matiska	RRA Paralegal
Mark Fistos	Attorney RRA
Mercedes Estrada	Katherine Ezell's Assistant
MG	Client (Epstein Case)
Michael Wheeler	Attorney RRA
Mike Fisten	Investigators RRA
N.R.	Client communication
Nora Batian	RRA Staff
Pasqual "Pat" Diaz	Investigators RRA
Pat Roberts	Investigators RRA
Paul Cassel	Co-Counsel on Epstein Case
Phaedra Xanthos	Forensic Accountant
Priscila Nascimento	Staff RRA
Richard Willits	Attorney
Richard Wolfe	Attorney RRA
Robert Buschel	Attorney RRA
Robert C. Josefsbergs	Counsel for other Epstein Victims
Robin T. Kempner	RRA Staff
Ronald Wise	Forensics (Epstein Case)
RRA Personnel	RRA
Russell Adler	Attorney RRA
Scott Goldstein	Attorney RRA
Scott Rothstein	Attorney RRA
Seth Lehrman	Attorney RRA
Shawn Gilbert	Prior Legal Assistant to Brad Edwards
Sid Garcia	Counsel for other Epstein Victims
Spencer Kuvin	Counsel for other Epstein Victims
Steven Jaffe	Attorney RRA
Stuart Mermelstein	Counsel for other Epstein Victims

MASTER CONTACT LIST REGARDING Privilege Log – Dated 2-23-2011
Farmer, Jaffe, Weissing, Edwards, Fistos & Lehrman

Susan K. Stirling	RRA Staff
Tami Wolfe	Attorney RRA
T. Edwards	Brad Edwards Wife
Unknown Staff	RRA STAFF
Wayne Black	Private Investigator
William J. Berger	Attorney RRA

From: Stephanie [redacted]
Sent: 6/14/2011 4:54:35 PM
To: jeevacation@gmail.com
CC: Lesley Groff[redacted]
Subject: RE: Events this week

Importance: High

Other events that are not listed below (they were sent over from Marshall Heyman at the WSJ) Let me know if you are interested.

Tonight: Red Rooster for Halle Berry, Simon & Schuster party for publication of the new James Bond Novel & the opening of Spiderman w/ an after party at bowlmore.
Wednesday: Self Magazine & Zooey Deschanel Party
Thursday: Worldwide Orphans w/ Amy Poehler

CALENDAR OF MAJOR EVENTS, OPENINGS, AND FUNDRAISERS IN NEW YORK

Tuesday, June 14, 2011

Sunrise: 5:25 am Sunset 8:26 pm Moon:
High: 77 Low: 61

After-School All-Stars of New York

PRINT | MAP | TWEET
Benefit Mandarin Oriental New York. New York. Contact: Janice Phillips. [redacted]
Event address: 80 Columbus Circle, New York. Event web address: www.asasny.org.
Tags: Fundraiser Child Advocacy Education K-12.
EXPAND

New York Area Professional Convention Management Association

PRINT | MAP | TWEET
Luncheon Reception, networking and program. Doubletree Guest Suites. New York. Contact: Shannon Harris. [redacted]
Event address: 1568 Broadway, New York. Event web address: pcma.org.
Tags: Discussion Luncheon Networking Association.
EXPAND

Business Development Institute

PRINT | MAP | TWEET
Mobile Financial Services Communications Leadership Forum Disucssions. New York University Midtown Campus. New York. Contact: Maria Feola. [redacted].
Event address: 11 West 42nd Street, New York. Event web address: www.bdionline.com/mobilefinancialforum0611.html.
Tags: Discussion Education Adult.
EXPAND

New York Professional Convention Management Association

PRINT | TWEET
Taking Care of Business: Moving from Success to Significance Discussions and networking. Business attire. Speaker(s): Sue Hershkowitz-Coore. Doubletree Times Square. Contact: Shannon Harris. [redacted].
Event address: 1568 Broadway 47th Street, New York,. Event web address: www.pcma.org/x147.xml?events=x19306.
Tags: Discussion Networking.
EXPAND

Agape International Spiritual Center

PRINT | MAP | TWEET
Gala and Premiere Screening 6:00 pm. "Discover the Gift." VIP reception, followed by viewing. Hosted by Michael Bernard Beckwith. Tickets from $20.00. Buy Tickets. NYU Skirball Center for the Performing Arts. New York.
Event address: 586 LaGuardia Place, New York. Event web address: skirballcenter.nyu.edu/calendar/discoverthegift.
Tags: Premiere Reception Screenings.
EXPAND

City Parks Foundation

PRINT | TWEET
Summerstage Gala 6:00 pm. Cocktails, dinner and concert. "Motown Meets NYC," theme. Tickets from $1,000.00. Central Park-Rumsey Playfield. New York. (212) 360-2756.
Event address: East 72nd St. off Fifth Ave., New York. Event web address: www.summerstage.org/donate_now/gala.html.
Tags: Concert Gala Opening Arts Performing Arts Environmental.
EXPAND

Greater New York Construction User Counci

PRINT | TWEET
2011 Chairman's Reception 6:00 pm. Cocktails and program. Hosted by Jonathan D. Resnick. Steelcase. New York.
Event address: 4 Columbus Circle, New York. Sponsored by Jack Resnick & Sons, Inc,McGowan Builders, Inc,Turner Construction. Event web address: buildingcongress.com.
Tags: Awards/Awards Shows Association.
EXPAND

ABWA - Association of Black Women Attorneys

PRINT | MAP | TWEET
35th Anniversary Celebration 6:30 pm. Cocktail reception, followed by dinner, awards and dancing. Speaker(s): Kim K.W. Rucker. Chaired by B. Shea Owens. Tickets from $250.00. Chelsea Piers. New York. Contact: Sponsorships:. (888) 933-2442.
Chelsea Piers: Pier Sixty. Event address: 23rd St. at the Hudson River, New York.
Tags: Gala Association.
EXPAND

UJA-Federation of New York

PRINT | MAP | TWEET
Digital Media and Marketing and Communications Dinner Cocktails and program. Business attire. Honoring Tim Armstrong, Jack Haber. The Pierre Hotel. New York. (212) 836-1853.
Event address: 2 East 61st St., New York. Event web address: ujafedny.org.
Tags: Dinner Association.
EXPAND

amfAR

PRINT | MAP | TWEET
Annual Inspiration Gala 7:00 pm. Cocktails, presentations, runway show, dinner, live auction and performances by Liza Minnelli and Jennifer Hudson. “Black Tie, Hot Metal," theme. Honoring James Franco,Michael Kors. Chaired by Klaus Bisenbach, Larry Boland,R. Martin Chavez, Ph.D, Paolo Diacci,Adam Norbury. MoMA - Museum of Modern Art. New York. Contact: Wilson Alexander Aguilar.
Event address: 11 West 53rd Street, New York. Sponsored by Grey Goose,Piaget,Reca Group,Wilhelmina Models. Event web address: www.amfar.org/spotlight/event.aspx?id=9522.
Tags: Gala Health AIDS.
EXPAND

GenArt

PRINT | MAP | TWEET
Film Festival Closing Night 7:30 pm. Screenings of "Hot Dogs & Hand Grenades," by Justin Corsbie and "Salvation Boulevard," by George Ratliff, followed by after-party and awards presentation at Hiro (88 9th Ave). Visual Arts Theater. New York.
Event address: 333 West 23rd Street, New York. Event web address: genart.org.
Tags: After party Awards/Awards Shows Screenings Arts Film Arts Visual Arts.
EXPAND

Making Books Sing

PRINT | MAP | TWEET
Fundraiser 7:30 pm. Beer, brewery tours and light fare. Hosted by Cat Greenleaf, Talib Kweli. Tickets from $15.00. Brooklyn Brewery. Brooklyn. Contact: Kimberly Wilson Marshall.
Event address: 79 North 11th St., Brooklyn. Event web address: makingbookssing.org.
Tags: Fundraiser Education K-12.
EXPAND

Wednesday, June 15, 2011

Sunrise: 5:25 am Sunset 8:27 pm Moon:
High: 79 Low: 62

NYSAE-New York Society of Association Executives

PRINT | MAP | TWEET
Installation of Officers & Directors Luncheon 11:30 am. Reception and program. Speaker(s): Dr. Jerry V. Teplitz. Tickets from $65.00. Doubletree Metropolitan Hotel. New York. (212) 206-8230.
Event address: 569 Lexington Ave., New York. Event web address: www.nysaenet.org.
Tags: Luncheon Association.
EXPAND

Women's Forum of New York

PRINT | MAP | TWEET
Inaugural Elly Awards 11:30 am. Lunch and program. Hon. chairs: Lucy Jarvis and Muriel Siebert. Hosted by Janice Reals Ellig. Speaker(s): Bobbi Brown,Barbara Walters. Honoring Evelyn H. Lauder,Diana Taylor. Chaired by Jane Chesnutt,Denise Seegal. Co-chaired by Beth Canavan,Lisa Caputo,Barbaralee Diamonstein-Spielvogel. Tickets from $300.00. Tables from $5,000.00. The Plaza Hotel. New York. Contact: Rita Crotty. [redacted].
Event address: 770 Fifth Ave, New York. Event web address: www.womensforumny.org.
Tags: Awards/Awards Shows Fundraiser Luncheon Education Adult.
EXPAND

Hike for Heroes

PRINT | MAP | TWEET
Reception Ceremony. Business casual attire. Chaired by Mitchell B. Modell. Tickets from $140.00. Sheraton New York Hotel & Towers. New York. Contact: Lindsay Carlton. [redacted].
Event address: 811 Seventh Ave., New York. Sponsored by Modell's Sporting Goods. Event web address: www.wishuponahero.com/hike-for-heroes/cocktail-party.
Tags: Reception Civic Family/Social Services.
EXPAND

UJA-Federation of New York

PRINT | MAP | TWEET
Annual Trust & Estates Event 6:00 pm. Cocktail reception, followed by program and dessert. Business attire. Honoring Ronald J. Stein. Tickets from $650.00. Hilton New York. New York. Contact: Meredith Waltzer. [redacted].
Event address: 1335 Avenue of the Americas, New York. Event web address: ujafedny.org.

Tags: Cocktail party Association.
EXPAND

UJA-Federation of New York

PRINT | MAP | TWEET
General Insurance Dinner Business attire. Honoring Kevin Kelley, Stephen P. McGill. Chaired by Joseph Boren. Grand Hyatt New York. New York. Contact: Loni Kraut. [redacted].
Event address: Park Ave. at Grand Central Terminal, New York. Event web address: ujafedny.org.
Tags: Awards/Awards Shows Dinner Association.
EXPAND

UNICEF-United Nations Children's Fund

PRINT | TWEET
Next Gen Photo Benefit 6:30 pm. Cocktails, hors d'oeuvres and silent auction. Tickets from $40.00. Phillips de Pury.
Event address: 450 Park Avenue,. Event web address: www.unicefusa.org/about/special-events/nextgen/photo-exhibit.html.
Tags: Auction Cocktail party Child Advocacy.
EXPAND

RIOULT Dance Company

PRINT | MAP | TWEET
Gala 7:00 pm. Performance and dinner. Honoring Robert Cole,Harsha Murthy. Tickets from $350.00. Joyce Theater. New York.
Event address: 175 Eighth Ave., New York.
Tags: Benefit Performance Gala Arts Performing Arts.
EXPAND

Thursday, June 16, 2011

Sunrise: 5:25 am Sunset 8:27 pm Moon:
High: 79 Low: 62

New York Building Congress

PRINT | MAP | TWEET
Reception for Speaker Christine C. Quin 8:00 am. Breakfast. Hosted by Richard Anderson, Joseph Mizzi,Frank J. Sciame. Tickets from $500.00. Sciame Organizations. New York. Contact: Ânne Mullaly Weir. [redacted].
Event address: 14 Wall Street, New York. Event web address: newyorkbuildingcongress.com.
Tags: Breakfast Speakers Fundraiser Association Politics Democratic.
EXPAND

UJA-Federation of New York

PRINT | MAP | TWEET
Music Visionary Luncheon Reception and program. Honoring Jody Gerson, Jon Platt. The Pierre Hotel. New York. Contact: Steven Singer. [redacted].
Event address: 2 East 61st St., New York. Event web address: ujafedny.org.
Tags: Luncheon Association.
EXPAND

Jewish Enrichment Center

PRINT | MAP | TWEET
2011 Grand Reception 5:30 pm. VIP reception, cocktails, dinner and presentation. Speaker(s): President George H.W. Bush. Honoring Craig A. Rothfeld,Stephen Siegel, Ari J. Storch. Gotham Hall. New York. (212) 889-5532.
Event address: 1356 Broadway, New York. Event web address: jeconline.com/dinner.
Tags: Fundraiser Reception Faith Jewish.

EXPAND

Professional Women In Construction

PRINT | MAP | TWEET
Networking Event 5:30 pm. Cocktails and dinner. Speaker(s): Michele Medaglia. Tickets from $80.00. Club 101. New York.
Event address: 101 Park Ave., New York. Event web address: pwcusa.org.
Tags: Dinner Discussion Networking Association.
EXPAND

Asian American Business Development Center

PRINT | MAP | TWEET
Tenth Anniversary Outstanding 50 Award Gala 6:00 pm. Cocktails, dinner and program. Co-chaired by Shaokao Cheng,Miguel Centeno,Joyce Chang,Renaud Dutreil,Edward Goldberg, Jim Hirani, Allan Huy, Peter Hwang, Eugene Kelly, Catherine Lee, Walter Shay. Waldorf=Astoria. New York. (212) 966-0100.
Event address: 301 Park Avenue, New York. Event web address: www.outstanding50award.com.
Tags: Awards/Awards Shows Dinner Gala Association Economic Development.
EXPAND

Songwriter's Hall of Fame

PRINT | MAP | TWEET
42nd Annual Dinner and 2011 Induction Ceremony 6:00 pm. Cocktails and awards presentation. New York Marriott Marquis. New York. (914) 579-1000.
Event address: 1535 Broadway, New York.
Tags: Awards/Awards Shows Dinner Arts Performing Arts.
EXPAND

Voices Against Brain Cancer

PRINT | MAP | TWEET
Sixth Annual Sounding Off for a Cure Concert 6:00 pm. Performances. Hammerstein Ballroom. New York City.
Event address: 311 West 34th Street, New York City.
Tags: Concert Fundraiser Health Cancer.
EXPAND

Catholic Charities - Archdiocese of New York

PRINT | MAP | TWEET
Third Annual Junior Board Gala Cocktails, hors d'oeuvres, gaming, and entertainment. “Casino Night," theme. Cocktail attire. Chaired by Stephanie Bagley,Timothy Spelman. Co-chaired by Sean Gorman,Christine Keith. Tickets from $125.00. Buy Tickets. Providence. New York. Contact: Kathleen McGowan. [redacted].
Event address: 311 West 57th St., New York. Fax: (212) 755-1526. Event web address: www.catholiccharitiesny.org/get-involved/junior-board/.
Tags: Cocktail party Fundraiser Association Faith Christian.
EXPAND

Fort Tryon Park Trust

PRINT | TWEET
Sunset on the Hudson 6:30 pm. Cocktails at the New Leaf Café, followed by dinner on the David Rockefeller Linden Terrace. Festive attire. Honoring Bette Midler,New York Restoration Project. Chaired by Edith Kean. Tables from $10,000.00. Fort Tryon Park. Contact: Jennifer Hoppa. [redacted].
Event address: Northern Manhattan,. Event web address: www.forttryonparktrust.org/sunset_on_the_hudson_gala.html.
Tags: Cocktail party Dinner Fundraiser Environmental.
EXPAND

Make-A-Wish Foundation of Metro NY

PRINT | MAP | TWEET
Annual Gala "An Evening of Wishes" Cocktails, dinner and program. Business Attire. Honoring Michael Delaney,James B. Lee, Jr. Co-chaired by Frank Bisignano,Thomas A. Roberts. Cipriani Wall Street. New York. Contact: Amy Epstein. [redacted]
Event address: 55 Wall St., New York. Event web address: metrony.wish.org.
Tags: Gala Health Cancer Health Pediatrics.
EXPAND

Persol

PRINT | TWEET
Magnificent Obsessions: 30 Stories of Craftsmanship in Film Exhibition opening. Invitation only. Honoring Milena Canonero,Terry Gilliam,Sir Ben Kingsley. Center 548. New York. Contact: Gina Sevilla. [redacted]
Event address: 548 West 22nd Street, New York.
Tags: Exhibition Opening.
EXPAND

Wounded Warriors Family Support Initiative

PRINT | TWEET
Special Event 6:30 pm. Cocktails and entertainment, with special performance by The Roots. Speaker(s): Captain Paul Bud Bucha. Intrepid Sea, Air & Space Museum. New York.
Event address: 1 Intrepid Square, Pier 86, 46th St. at 12th Ave., New York. Event web address: woundedwarriorsinitiative.com/event.php#roots.
Tags: Fundraiser Civic.
EXPAND

Worldwide Orphans Foundation

PRINT | MAP | TWEET
Matt Blesso's Third Annual Birthday Celebration 7:00 pm. Cocktails. Hosted by Dr. Jane Aronson,Amy Poehler. Tickets from $75.00. Private Location.
Event web address: www.wwo.org.
Tags: Cocktail party Fundraiser Child Advocacy.
EXPAND

Actors Fund

PRINT | MAP | TWEET
Benefit Performance 8:00 pm. "Zarkana, Cirque du Soleil". Tickets from $125.00. Radio City Music Hall. New York. Contact: Stephen Joseph. [redacted]
Event address: 1260 Ave. of the Americas, New York. Event web address: actorsfund.org.
Tags: Benefit Performance Rally/March Arts Performing Arts.
EXPAND

Friday, June 17, 2011

Sunrise: 5:25 am Sunset 8:27 pm Moon:
High: 79 Low: 62

Action Against Hunger

PRINT | MAP | TWEET
Spanish Wine Festival 6:30 pm. Culinary and wine tastings. Hosted by PJ Wine. Metropolitan Pavilion. New York. (212) 967-7800.
Event address: 125 West 18th St., New York. Event web address: www.actionagainsthunger.org.
Tags: Tasting Wine Tasting Social Services Food Banks.
EXPAND

New York Child Learning Institute / Phoenix Center Inc

PRINT | MAP | TWEET

2011 Annual Black Tie Affair & Auction Cocktails, dinner and program. Black tie attire. Invitation only. Hosted by Knights of York. Honoring Dr. Joan Fallon,Bob Hurley, Carol Laurenzano,Jim Watkins,Lauren Thierry Watkins. Chaired by Declan Connolly. Co-chaired by Thomas J. Petersen. Tickets from $275.00. United Nations Delegates Dining Room. New York. Contact: Aimee Demilia Newsham. [redacted].
Event address: United Nations Building, First Ave. at 45th St., New York. Fax: (201) 485-8523. Event web address: www.knightsofyork.org.
Tags: Auction Gala Association Education K-12.
EXPAND

EXHIBIT A

specifically, how do we get businesses to do more in terms of hiring, spend less on redtape, less on bureaucracy, and reduce the regulatory burden in smart ways?

The current administration has said some of the right things but actually moved in the wrong direction. We have seen a sharp increase in the last couple of years in what are deemed to be major economically significant rules. That is defined as regulations that impose a cost on the economy of $100 million or more.

According to the administration's Office of Management and Budget, the current administration has been regulating at a pace of 84 major rules per year. By way of comparison, that is about a 50-percent increase over the regulatory output during the Clinton administration, which had about 56 rules per year, and an increase from the Bush administration as well. So we have seen more regulations and more significant regulations.

I was encouraged to hear President Obama's words when he talked about the Executive order in January, which is entitled "Improving Regulation and Regulatory Review." But now we need to see action. We need to see it from the administration, from individual agencies to provide real regulatory relief for job creators to be able to reduce this drag on the economy.

One commonsense step we can take is to strengthen what is called the Unfunded Mandates Relief Act. It was passed in 1995. It was bipartisan. I was a cosponsor in the House of Representatives. It is an effort to require Federal regulators to evaluate the cost of rules, to look at the benefits and the costs, and to look at less costly alternatives on rules.

The two amendments I would like to offer over the next few days as we consider the legislation before us would improve this Unfunded Mandates Reform Act, and it would reform it in ways that are entirely consistent with the principle President Obama has laid out and committed to in his Executive order on regulatory review.

The first amendment would require agencies specifically to assess potential effects of new regulations on job creation—so focusing in on jobs—and to consider market-based and nongovernmental alternatives to regulation. This would broaden the scope of the Unfunded Mandates Relief Act to require cost-benefit analysis of rules that impose direct or indirect costs of $100 million a year or more. So, again, this is for major rules of $100 million or more. It would also require agencies to adopt the least costly or least burdensome option that achieves whatever policy goals have been set out by Congress. It seems to me it is a commonsense amendment. I hope we will get bipartisan support for it.

The second amendment would extend the Unfunded Mandates Relief Act to so-called independent agencies which today are actually exempt from the cost-benefit rules that govern all other agencies. In 1995, we had this debate and determined at that time we would not extend the legislation to independent agencies. In the interim, independent agencies have been providing more and more rules, have put out more and more regulations, and are having a bigger and bigger impact. An example of an independent agency would be the SEC, the Securities and Exchange Commission, or the CFTC, which is the Commodity Futures Trading Commission. These are agencies that, although independent in the executive branch, are very much involved in putting out major rules and regulations. It is sometimes called the "headless fourth branch" of government because their rules are not reviewed for cost-benefit analysis, even by the OMB, the Office of Management and Budget, in its Office of Information and Regulatory Affairs, so-called OIRA.

We have looked at some GAO data and put together various studies, and it appears to us that there are about 200 regulations that were issued between 1996 until today that would be deemed to have an impact of $100 million or more on the economy but were automatically excluded from the Unfunded Mandates Relief Act because they were deemed to be from independent agencies.

So it is basically closing a loophole and closing this independent agency loophole, which I believe is a sensible reform. It has been endorsed by many people, including, interestingly, the current OIRA Administrator and the President's regulatory czar, Cass Sunstein, who, in a 2002 Law Review article, talked about the fact that this is an area where UMRA ought to be extended because, again, there were so many independent agencies that were putting out regulations impacting job creation in this country.

No regulation, whatever its source, should be imposed on American employers or on State and local governments without serious consideration of the costs, the benefits, and the availability of a least-burdensome alternative. Both these amendments would move us further toward that sensible goal, and I hope the leadership will allow these amendments to be offered. I think they fit well with the underlying legislation. If they are offered, I certainly urge my colleagues on both sides of the aisle to support them.

I yield the floor. I suggest the absence of a quorum.

The PRESIDING OFFICER. The clerk will call.

The bill clerk proceeded to call the roll.

Mr. DURBIN. Mr. President, I ask unanimous consent that the order for the quorum call be rescinded.

The PRESIDING OFFICER. Without objection, it is so ordered.

MORNING BUSINESS

Mr. DURBIN. Mr. President, I ask unanimous consent that Senators be allowed to speak as in morning business for up to 10 minutes each.

The PRESIDING OFFICER. Without objection, it is so ordered.

TRIBUTE TO LOUIS E. GIVAN

Mr. MCCONNELL. Mr. President, I rise today to recognize a distinguished Kentuckian who has worked tirelessly on behalf of our Nation's soldiers, sailors and marines for more than 40 years. Louis E. Givan, a lifelong resident of my hometown of Louisville, has played a vital role in protecting the men and women of our Armed Forces and our country's defense.

Formerly a sailor himself in the U.S. Navy, he has served for the last 11 years as the general manager of Raytheon Missile Systems operations in Louisville. I was saddened to hear of his retirement from that position this coming July 5. He will certainly be missed.

Mr. Givan—or, to those who know him, Ed—was a 1966 graduate of St. Xavier High School in Louisville and in 1970 earned his bachelor of science degree in mechanical engineering from the J.B. Speed School of Engineering at the University of Louisville. In 1968, he began working at the Naval Ordnance Station in Louisville, and he stayed at that post until 1996, in various engineering and supervisory positions.

In 1996 the Naval Ordnance Station transitioned to private ownership, and Ed's leadership was crucial in making that transition a successful one. The facility eventually became part of Raytheon Missile Systems, and Ed was appointed general manager in 2000. As general manager, Ed has led Raytheon Missile Systems in Louisville to great success, success for both the company and for the local community. They design, develop, and produce vital weapons systems for our armed forces, enabling America to have the most formidable military force in the world. Weapons produced at the Louisville facility are used by our forces in all parts of the globe, including in Iraq.

Kentucky is lucky to have benefitted from Ed's dedication, commitment to excellence, and leadership for so many years. I am sure his wife Velma; his sons Eddie, Tony, and Chris; and his grandchildren Benjamin, Nathan, Isaac, Macy and Natalie are all very proud of what Ed has accomplished. I wish him the very best in retirement, and I am sure my colleagues join me in saying that this U.S. Senate thanks Mr. Louis E. "Ed" Givan for his faithful service.

CRIME VICTIMS' RIGHTS ACT

Mr. KYL. Mr. President, I ask unanimous consent that the following letter be printed in the RECORD.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

U.S. SENATE,
Washington, DC, June 6, 2011.

HON. ERIC H. HOLDER, Jr.,
Attorney General; U.S. Department of Justice, Washington, DC.

DEAR ATTORNEY GENERAL HOLDER: I am writing about the Justice Department's implementation of the Crime Victims' Rights Act—an act that I co-sponsored in 2004. These questions relate to an Office of Legal Counsel ("OLC") Opinion made public on May 20, 2011 and more broadly to concerns I have heard from crime victims' advocates that the Department has been thwarting effective implementation of the Act by failing to extend the Act to the investigative phases of criminal cases and by preventing effective appellate enforcement of victims' rights. I am writing to ask you to answer these questions and explain the Department's actions in these areas.

GOVERNMENT PROTECTION OF VICTIMS' RIGHTS DURING INVESTIGATION OF A CRIME

When Congress enacted the CVRA, it intended to protect crime victims throughout the criminal justice process—from the investigative phases to the final conclusion of a case. Congress could not have been clearer in its direction that using "best efforts" to enforce the CVRA was an obligation of "[o]fficers and employees of the Department of Justice and other departments and agencies of the United States engaged in the *detection, investigation*, or prosecution of crime . . . ." 18 U.S.C. §3771(c)(1) (emphasis added). Congress also permitted crime victims to assert their rights either in the court in which formal charges had already been filed "or, *if no prosecution is underway*, in the district court in the district in which the crime occurred." 18 U.S.C. §3771(d)(3) (emphasis added).

Despite Congress' clear intention to extend rights to crime victims throughout the process, the Justice Department is reading the CVRA much more narrowly. In the recent OLC opinion, for example, the Department takes the position that "the CVRA is best read as providing that the rights identified in section 3771(a) are guaranteed from the time that criminal proceedings are initiated (by complaint, information, or indictment) and cease to be available if all charges are dismissed either voluntarily or on the merits (or if the Government declines to bring formal charges after the filing of a complaint)." The Availability of Crime Victims' Rights Under the Crime Victims' Rights Act of 2004, Memorandum from John E. Bies (Dec. 17, 2010, publicly released May 20, 2011) (hereinafter "OLC Opinion"). Indeed, in that same opinion, I am surprised to see the Department citing a snippet from my floor remarks during the passage of the CVRA for the proposition that crime victims can confer with prosecutors only after the formal filing of charges. See id. at 9 (citing 150 Cong. Rec. S4260, S4268 (Apr. 22, 2004) (statement of Sen. Kyl).

I did want to express my surprise that your prosecutors are so clearly quoting my remarks out of context. Here is the full passage of my remarks, which were part of a colloquy with my co-sponsor on the CVRA, Senator Feinstein:

Senator Feinstein: Section . . . (a)(5) provides a right to confer with the attorney for the Government in the case. *This right is intended to be expansive.* For example, the victim has the right to confer with the Government concerning any critical stage or disposition of the case. *The right, however, is not limited to these examples.* I ask the Senator if he concurs in this intent.

Senator Kyl: Yes. The intent of this section is just as the Senator says. This right to confer does not give the crime victim any right to direct the prosecution. Prosecutors should consider it part of their profession to be available to consult with crime victims about concerns the victims may have which are pertinent to the case, case proceedings or dispositions. Under this provision, *victims are able to confer with the Government's attorney about proceedings after charging.*

150 Cong. Rec. S4260, S4268 (Apr. 22, 2004) (statements of Sens. Feinstein & Kyl) (emphases added). Read in context, it is obvious that the main point of my remarks was that a victim's right to confer was "intended to be expansive." Senator Feinstein and I then gave various examples of situations in which victims could confer with prosecutors, with the note that the right to confer was "not limited to these examples." It is therefore troubling to me that in this opinion the Justice Department is quoting only a limited portion of my remarks and wrenching them out of context to suggest that I think that crime victims do not have any right to confer (or to be treated with fairness) until after charging.

In giving an example that the victims would have such rights after charging, I was not suggesting that they had no such right earlier in the process. Elsewhere in my remarks I made clear that crime victims had rights under the CVRA even before an indictment is filed. For example, in the passage quoted above, I made clear that crime victims had a right to consult about both "the case" and "case proceedings"—i.e., both about how the case was being handled before being filed in court and then later how the case was being handled in court "proceedings." As another example, Senator Feinstein and I explained that we had drafted the CVRA to extend a right to victims to attend only "public" proceedings, because otherwise the rights would extend to grand jury proceedings. See, e.g., 150 Cong. Rec. S4260, S4268 (Apr. 22, 2004) (statements of Sens. Feinstein & Kyl). Of course, no such limitation would have been necessary under the CVRA if CVRA rights attach (as the Department seems to think) only after the filing of a grand jury indictment.

Courts have already rejected the Justice Department's position that the CVRA applies only after an indictment is filed. For example, in *In re Dean*, 527 F.3d 391 (5th Cir. 2008), the Department took the position that crime victims had no right to confer with prosecutors until after the Department had reached and signed a plea agreement with a corporation (BP Products North America) whose illegal actions had resulted in the deaths of fifteen workers in an oil refinery explosion. Of course, this position meant that the victims could have no role in shaping any plea deal that the Department reached. In rejecting the Department's position, the Fifth Circuit held that "the government should have fashioned a reasonable way to inform the victims of the likelihood of criminal charges and to ascertain the victims' views on the possible details of a plea bargain." Id. at 394.

In spite of this binding decision from the Fifth Circuit, crime victims' advocates have reported to me that the Justice Department is still proceeding in the Fifth Circuit and elsewhere on the assumption that it has no obligations to treat victims fairly or to confer with them until after charges are formally filed. Given the Fifth Circuit's Dean decision, this position appears to place the Department in violation of a binding court ruling that extends rights to thousands of crime victims in Louisiana, Mississippi, and Texas. And more generally, the Department's position simply has no grounding in the clear language of the CVRA.

My first question: What is the Justice Department doing to extend to victims their right to fair treatment and their right to confer with prosecutors when the Justice Department is negotiating pre-indictment plea agreements and non-prosecution agreements with defense attorneys, including negotiations within the Fifth Circuit?

CRIME VICTIMS' RIGHT TO APPELLATE PROTECTION

Protection of crime victims' rights in appellate courts is an important part of the CVRA. As you know, when Congress passed the CVRA, the federal courts of appeals had recognized that crime victims could take ordinary appeals to protect their rights. See, e.g., *Doe v. United States*, 666 F.2d 43, 46 (4th Cir. 1981) (rape victim allowed to appeal district court's adverse "rape shield statute" ruling); *United States* v. *Kones*, 77 F.3d 66 (3rd Cir. 1996) (victim allowed to appeal adverse restitution decision). Congress sought to leave these protections in place, while expanding them to ensure that crime victims could obtain quick vindication of their rights in appellate courts by providing—in §3771(d)(3)—that "[i]f the district court denies the relief sought, the [victim] may petition the court of appeals for a writ of mandamus." 18 U.S.C. §3771(d)(3). Ordinarily, whether mandamus relief should issue is discretionary. The plain language of the CVRA, however, specifically and clearly overruled such discretionary mandamus standards by directing that "[t]he court of appeals *shall take up and decide such application forthwith* . . . ." 18 U.S.C. §3771(d)(3) (emphasis added). As I explained when the Senate considered the CVRA:

[W]hile mandamus is generally discretionary, this provision [18 U.S.C. §3771(d)(3)] means that courts *must* review these cases. Appellate review of denials of victims' rights is just as important as the initial assertion of a victim's right. This provision ensures review and encourages courts to *broadly defend* the victims' rights.

150 CONG. REC. S4270 (Apr. 22, 2004) (statement of Sen. Kyl) (emphases added). Similarly, the CVRA's co-sponsor with me, Senator Feinstein, stated that the Act would create "a new use of a very old procedure, the writ of mandamus. This provision will establish a procedure where a crime victim can, in essence, immediately *appeal* a denial of their rights by a trial court to the court of appeals." 150 CONG. REC. S4262 (statement of Sen. Feinstein) (emphases added); see also id. (statement of Sen. Kyl) (crime victims must "be able to have . . . the appellate courts take the appeal and order relief). In short, the legislative history shows that §3771(d)(3) was intended to allow crime victims to take accelerated appeals from district court decisions denying their rights and have their appeals reviewed under ordinary standards of appellate review.

In spite of that unequivocal legislative history, the Justice Department has in past cases asserted a contrary position. In *In re Antrobus*, 519 F.3d 1123 (10th Cir. 2008), Ken and Sue Antrobus sought to obtain appellate review of a ruling by a trial court that they could not deliver a victim impact statement at the sentencing of the man who sold the murder weapon used to kill their daughter. The Tenth Circuit ruled against them on the basis that the Antrobuses were not entitled to regular appellate review, but only discretionary mandamus review. See id. at 1124–25. The Tenth Circuit did not consider the legislative history in reaching this conclusion, leading the Antrobuses to file petitions for rehearing and rehearing en banc—petitions that recounted this legislative history. In response, the Justice Department asked the Tenth Circuit to deny the victims' petitions. Remarkably, the Justice Department told the Tenth Circuit that it could ignore the

legislative history because the CVRA "is unambiguous." Response of the United States, *In re Antrobus*, No. 08-4002, at 12 n.7 (10th Cir. Feb. 12, 2008).

At the time that the Justice Department filed this brief, no Court of Appeals agreed with the Tenth Circuit. At the time, three other Circuits had all issued unanimous rulings that crime victims were entitled to regular appellate review. See *In re W.R. Huff Asset Mgmt. Co.*, 409 F.3d 555, 562 (2d Cir. 2005); *Kenna v. US. Dist. Ct., for the Cent. Dist. of Ca.*, 435 F.3d 1011, 1017 (9th Cir. 2006); *In re Walsh*, 229 Fed.Appx. 58, at 60 (3rd Cir. 2007).

My next question for you is, given that the Justice Department has an obligation to use its "best efforts," 18 U.S.C. §3771(c)(1), to afford crime victims their rights, how could the Department argue in Antrobus (and later cases) that the CVRA "unambiguously" denied crime victims regular appellate protections of their rights when three circuits had reached the opposite conclusion?

GOVERNMENT'S RIGHT TO ASSERT ERROR DENIAL OF VICTIMS' RIGHTS

To further bolster protection of crime victims' rights, Congress also included an additional provision in the CVRA—§3771(d)(4)—allowing the Justice Department to obtain review of crime victims' rights issues in appeals filed by defendants: "In any appeal in a criminal case, the Government may assert as error the district court's denial of any crime victim's right in the proceeding to which the appeal relates." 18 U.S.C. §3771(d)(4). The intent underlying this provision was to supplement the crime victims' appeal provision found in §3771(d)(3) by permitting the Department to also help develop a body of case law expanding crime victims' rights in the many defense appeals that are filed. It was not intended to in any way narrow crime victims' rights to seek relief under §3771(d)(3). Nor was it intended to bar crime victims from asserting other remedies. For instance, it was not intended to block crime victims from taking an ordinary appeal from an adverse decision affecting their rights (such as a decision denying restitution) under 28 U.S.C. §1291. Crime victims had been allowed to take such appeals in various circuits even before the passage of the CVRA. See, e.g., *United States v. Kones*, 77 F.3d 66 (3rd Cir. 1996) (crime victim allowed to appeal restitution ruling); *United States v. Perry*, 360 F.3d 519 (6th Cir. 2004) (crime victims allowed to appeal restitution lien issue); *Doe v. United States*, 666 F.2d 43, 46 (4th Cir. 1981) (crime victim allowed to appeal rape shield ruling).

As I explained at the time the CVRA was under consideration, this provision supplemented those pre-existing decisions by "allow[ing] the Government to assert a victim's right on appeal even when it is the defendant who seeks appeal of his or her conviction. This ensures that victims' rights are protected throughout the criminal justice process and that they do not fall by the wayside during what can often be an extended appeal that the victim is not a party to." 150 CONG. REC. S4270 (Apr. 22, 2004) (statement of Sen. Kyl).

I have heard from crime victims' advocates that the Department has not been actively enforcing this provision. Indeed, these advocates tell me that they are unaware of even a single case where the Department has used this supplemental remedy. My final question: Is it true that the Department has never used this provision in even a single case in the more than six years since the CVRA was enacted?

Sincerely,

JON KYL,
U.S. Senator.

HONORING OUR ARMED FORCES

SERGEANT VORASACK T. XAYSANA

Mr. BENNET. Mr. President, it is with a heavy heart that I rise today to honor the life and heroic service of SGT Vorasack T. Xaysana. Sergeant Xaysana, assigned to the Headquarters and Headquarters Company, 2nd Battalion, based in Fort Hood, TX, died on April 10, 2011. Sergeant Xaysana was serving in support of Operation New Dawn in Kirkuk, Iraq. He was 30 years old.

A native of Westminster, CO, Sergeant Xaysana enlisted in the Army in 2005. During over 6 years of service, he distinguished himself through his courage and dedication to duty. Sergeant Xaysana's exemplary service quickly won the recognition of his commanding officers. He earned, among other decorations, the Iraq Campaign Medal, the Global War on Terrorism Service Medal, and the Army Good Conduct Medal.

Sergeant Xaysana worked on the front lines of battle, serving in the most dangerous areas of Iraq. Mark Twain once said, "The fear of death follows from the fear of life. A man who lives fully is prepared to die at any time." Sergeant Xaysana's service was in keeping with this sentiment—by selflessly putting country first, he lived life to the fullest. He lived with a sense of the highest honorable purpose.

At substantial personal risk, he braved the chaos of combat zones throughout Iraq. Though his fate on the battlefield was uncertain, he pushed forward, protecting America's citizens, her safety, and the freedoms we hold dear. For his service and the lives he touched, Sergeant Xaysana will forever be remembered as one of our country's bravest.

To Sergeant Xaysana's parents, Thong Chanh and Manithip, and to his entire family, I cannot imagine the sorrow you must be feeling. I hope that, in time, the pain of your loss will be eased by your pride in Vorasack's service and by your knowledge that his country will never forget him. We are humbled by his service and his sacrifice.

GRAZING IMPROVEMENT ACT

Mr. BARRASSO. Mr. President, I rise today to submit for the RECORD an article written by Karen Budd-Falen and published May 28, 2011, in the Wyoming Livestock Journal. The article's title is "Leveling the Playing Field: Support for the Grazing Improvement Act of 2011."

The title of the article is instructive. Anyone living and working in rural communities knows the playing field is not level. The National Environmental Policy Act has become the preferred tool to delay and litigate grazing permit renewals for American ranchers.

Livestock grazing on public lands has a strong tradition in Wyoming and all Western States. Ranchers are proud stewards of the land, yet the permitting process to renew their permits is severely backlogged due to litigation aimed at eliminating livestock from public land.

During times of high unemployment and increasing food prices, we need to be encouraging jobs in rural economies. We need to be fostering an environment to raise more high quality, safe, American beef and lamb; not litigating less.

That is why I introduced the Grazing Improvement Act of 2011. This legislation will provide the certainty and stability public grazing permit holders desperately need in order to continue supporting rural jobs, providing healthy food, and maintaining open spaces for recreation and wildlife.

It is time to help level the playing field for hard working ranching families across the West. Their livelihood should not be held hostage by litigation and anti-grazing special interest groups. I thank my colleagues, Senators ENZI, CRAPO, HATCH, HELLER, RISCH, and THUNE, in supporting ranching families and this legislation.

Mr. President, I ask unanimous consent to have printed in the RECORD the article to which I referred.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

[From the Wyoming Livestock Roundup, May 28, 2011]

LEVELING THE PLAYING FIELD: SUPPORT FOR THE GRAZING IMPROVEMENT ACT OF 2011

(By Karen Budd-Falen)

If jobs and the economy are the number one concern for America, why are rural communities and ranchers under attack by radical environmental groups and overzealous federal regulators?

America depends upon the hundreds of products that livestock provide, yet radical groups and oppressive regulations make it almost impossible for ranchers to stay in business. Opposition to these jobs comes in the form of litigation by radical environmental groups to eliminate grazing on public lands, radical environmental group pressure to force "voluntary" grazing permit buyouts from "willing sellers," and holding permittees hostage to the court deference given to regulatory "experts." The playing field is not level and the rancher is on the losing side. The Grazing Improvement Act of 2011 will level the playing field. I urge your support.

The Grazing Improvement Act of 2011 does the following:

1. Term of Grazing Leases and Permits. Both BLM and Forest Service term grazing permits are for a 10-year term. This bill extends that term to 20 years. This extension does not affect either the BLM's or Forest Service's ability to make interim management decisions based upon resource or other needs, nor does it impact the preference right of renewal for term grazing permits or leases.

2. Renewal, Transfer and Reissuance of Grazing Leases and Permits. This section codifies the various "appropriation riders" for the BLM and Forest Service requiring that permits being reissued, renewed or transferred continue to follow the existing terms and conditions until the paperwork is complete. Thus, the rancher is not held hostage to the ability of the agency to get its

From: ASMALLWORLD [ASMALLWORLD@travel.asmallworld.net]
Sent: 8/3/2011 2:11:03 PM
To: jeeproject@yahoo.com
Subject: ASW Travel Deals: Sky Dive Mount Everest, See New York's Newest, Do Paris's Chicest

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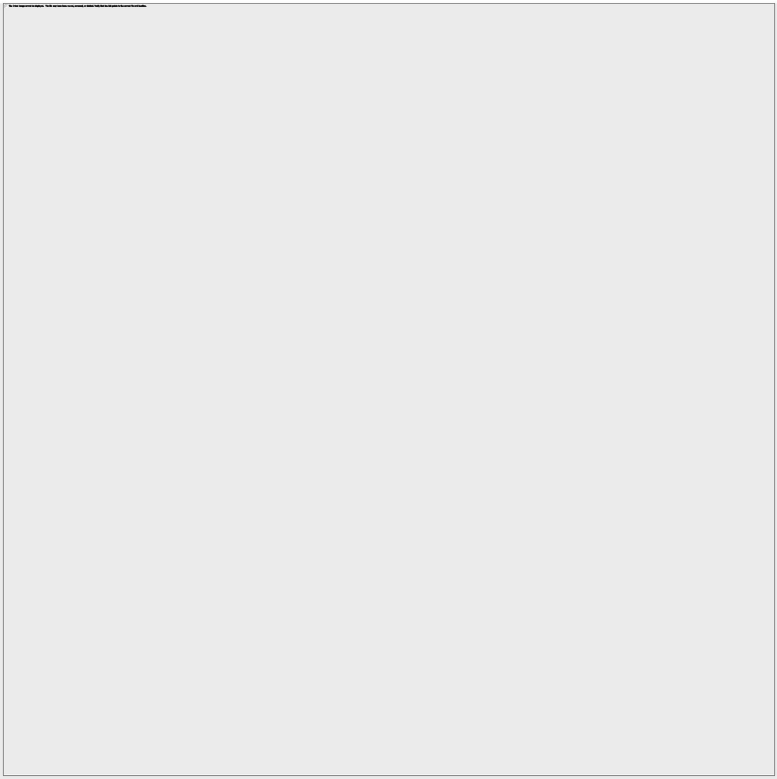
Taking the Plunge

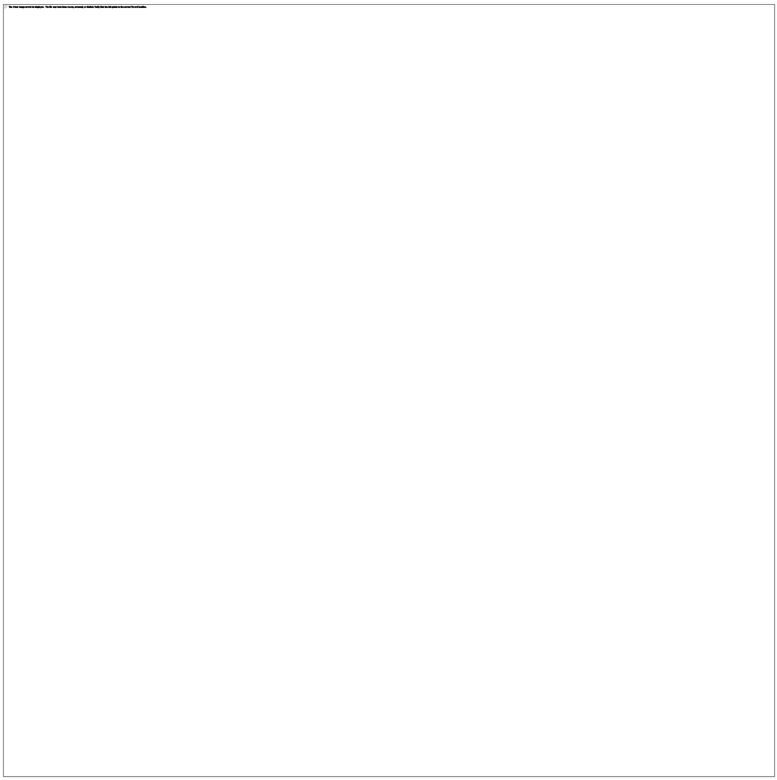
Wednesday, August 03, 2011



"New and noteworthy" is a term that gets tossed around a lot in the travel world, but we're taking it seriously to heart this week at Jetsetter. The "new" is the Dream Downtown NYC, a hip, reinvented space at the crossroads of Chelsea and the Meatpacking District (MePa, if you really must). The "noteworthy" is a little thing called skydiving at Mount Everest. Whether it's lounging poolside in New York or jumping out of a plane in full view of the world's highest mountain, there's a lot going on this week. Read on for all the details, including properties in Paris, San Francisco, Vegas, Miami and more. (Image: Skydive Mount Everest - on sale Sat, Aug 6.)

Hip Manhattan Newcomer... with Real Sand

Dream Downtown - NYC



The new Dream Downtown has the best of both worlds. Housed in a 1960s building designed by Albert C. Ledner, it's situated at the crux of Manhattan's art, design and nightlife scenes between Chelsea and the Meatpacking District. With a hot rooftop bar, a Miami-meets-Ibiza pool (with lounge chairs set in real sand) and modern rooms with classic Downtown views, you can have your party and a good night's sleep, too.

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Now Live

Romance by the Arc de Triomphe

Mon Hotel - Paris

Just a short walk from the Arc de Triomphe, Mon Hotel sits on a quiet street off the bustling boulevards. Designer Aurélia Santoni fashioned this intimate boutique property with eccentricity and flair; lampshades from Dutch design firm Moooi hang above Utrecht armchairs in the lobby. Above all, the style of the guestrooms and the service stress comfort; Mon feels like your personal Paris *pied-à-terre*.

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Beach, Spa, Repeat in Crete

Candia Maris Resort - Crete

Just outside Heraklion, Crete's capital city, the Candia Maris is a sprawling beachside resort spanning nearly 10 acres. Although the property lacks the charm of smaller hotels, it more than compensates with its amenities, which include tennis courts and seven pools. The highlight is the vast thalassotherapy spa, which underwent a multimillion-dollar renovation in 2008.

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Sleep in a Palace in Portugal

Vidago Palace - Portugal

In the mountainous north of the country, just over an hour from Porto, the recently opened Vidago Palace has, in one fell swoop, raised the bar for luxury getaways in Portugal. As far removed from the sun and sand of the touristy Algarve as you can get, this is a destination for the discerning traveler and the lover of fine things, whether they be cigars, hand-painted silk wallpaper, the country's best spa or a championship golf course.

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The Budapest Bauhaus

Mamaison Hotel Budapest

Leisure and business travelers feel like locals at this historic boutique hotel set among the embassies and grand residences of Budapest's tree-lined Andrassy Avenue. Built in 1937 and completely renovated three years ago, the hotel is home to a hip-again Bauhaus style in the comfortable rooms and gourmet dining at on-site Baraka Restaurant. For exploring, you can't beat the location: It's a short walk to restaurants, parks, museums and the city's famed thermal baths.

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A Study in Swiss Chic

Cervo - Switzerland

The Cervo may have a Swiss address, but there's nothing neutral about this boutique hotel's atmosphere and hospitality. In Zermatt, a legendary ski village where the Matterhorn ("Horu" to locals) dominates the landscape (and the activities, yearround) the hotel has the requisite majestic views. But modern interiors and quirky accents like antlers and cheerful checkerboard patterns make the Cervo a study in Swiss chic.

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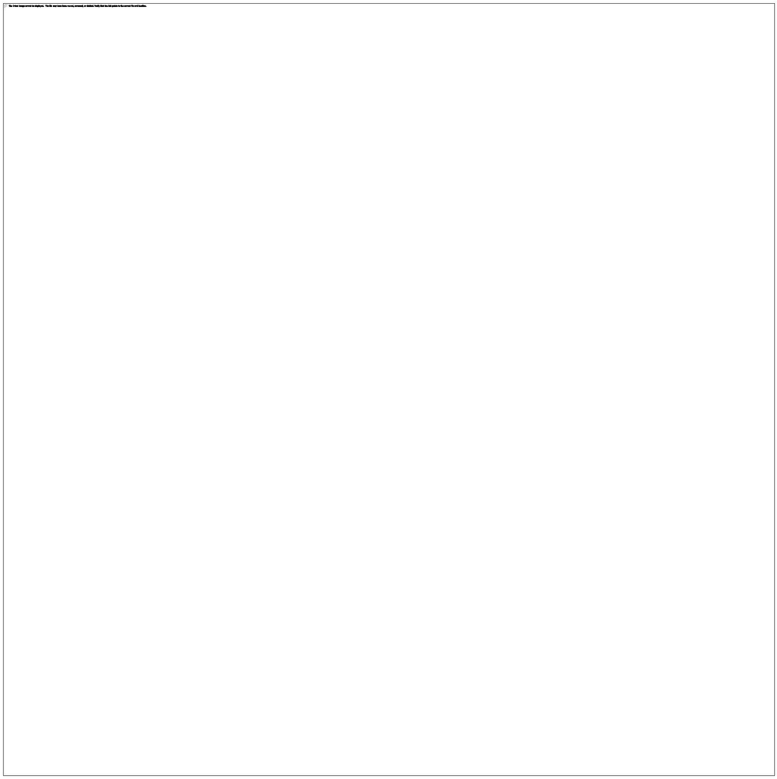
Living the Fantasy in Las Vegas

The Palms - Las Vegas



The Palms Las Vegas is all about classic hedonism: nightlife, gambling, pool parties and sweet guestrooms for more after-hours fun. Within the Palms enclave, the Palms Fantasy Tower flaunts a cool, contemporary feel to suit the tastes of its young and stylish party-hard crowds, perfect for hosting the true "what happens in Vegas stays in Vegas" experience.

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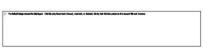

A Classic San Francisco Stay

Omni San Francisco Hotel

In a beautifully renovated redbrick-and-stone former bank building, the Omni San Francisco has an elegant ambiance and draws inspiration from Renaissance Florence. The spacious rooms have carved-mahogany furniture and nine-foot-high crown molded ceilings, while sparkling crystal chandeliers, mahogany paneling and an iron-and-marble staircase define the lobby. Best of all, it's within walking distance from some of the city's top attractions like Union Square, North Beach and Chinatown.

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Hilltop Romance on Phuket

The Pavilions - Phuket

These hilltop retreats are some of Phuket's most romantic crash pads thanks to sublime panoramic Andaman Sea views and the island's most discreet staff. All villas include swimmable pools and roomy decks for sun and shade. The 360 bar attracts the island's best dressed inhabitants who flock here at sundown for the calm view then stay sipping colorful cocktails late into the warm night.

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Now Live

Beachfront Zen Near Cancun

La Amada Hotel - Playa Mujeres

Looking more like some millionaire's Miami crib than a traditional Cancún resort, the all white, Zen-minimalist La Amada Hotel exudes a down-to-earth sexiness and an understated elegance - all creamy sofas, gauzy curtains and personal Jacuzzis. Just 20 minutes north of central Cancún in Playa Mujeres, La Amada is on a long, pristine and very secluded beach.

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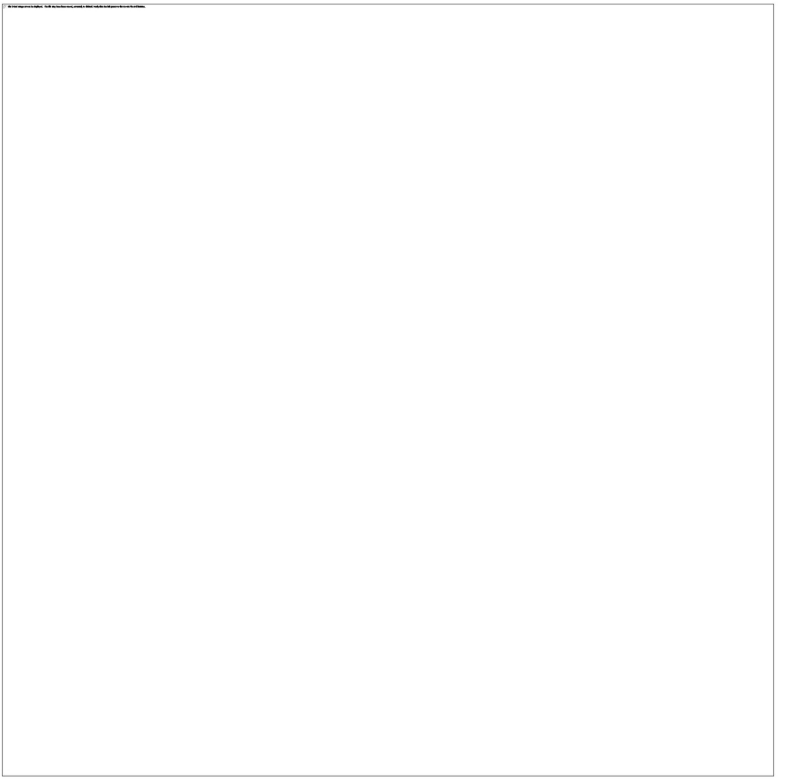
Stately Style in the Heart of Washington D.C.

The Madison - D.C.



Named for James Madison, the fourth president and "father of the Constitution," this stately hotel has traditional style and refined service - plus, a location that puts many of Washington's must-see museums and monuments along the Mall within walking distance. Opened in 1963, the 353-room hotel has hosted the Dalai Lama, the occasional celebrity and every U.S. president since John F. Kennedy except Barack Obama. But don't worry - you can stop by the White House, which is just five blocks away.

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Now Live

Where Esther Williams Meets Chanel

The Raleigh - South Beach

The Raleigh is different from most properties in South Beach, with a vibe that's more Deco cool than decked out to the nines. A stay here feels a bit like a trip to the 1940s - dressed in whites one minute, casual the next. It's all about lounging in style by the pool, which has hosted everything from Esther Williams swimming routines to Chanel's cruise collection show. The Raleigh itself is a lot like that pool: cool, pretty and a place to be seen.

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Starting Thursday 4/8 at 8pm BST

The Classic SoCal Beach Escape

Shorebreak - California

Shorebreak, a 157-room hotel on Huntington Beach, lives up to the SoCal lifestyle celebrated on breezy beach postcards. From your private balcony, you'll gaze over a classic California coast pier, with the Pacific stretching out behind it. Surf by day, then chow down on room-service orecchiette pasta with seared diver scallops before heading out to a beachside bonfire.

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Starting Thursday 4/8 at 8pm BST

Attention Adrenaline Junkies

Skydive Mount Everest

As any adrenaline junkie knows, skydiving is the ultimate thrill: Those few seconds during free fall are as close to flying as we humans will probably ever get. Now imagine hurling yourself out of a plane at 29,500 feet - in full view of Mount Everest. To call it a rush would be an understatement, but tour company Everest Skydive makes this once-in-a-lifetime experience possible. During this 10-night/11-day tour, beginning in Kathmandu, you'll get your bearings on the ground with some sightseeing and then hike up to the drop site, where the true adventure begins. And with all the details - accommodations, gear, professional instruction - taken care of, skydivers can simply enjoy the (truly unforgettable) moment.

Click here to preview sale

Starting Saturday 6/8 at 5pm BST

The South African Safari Goes Posh

Morukuru - South Africa

In the heart of the Madikwe Game Reserve, Morukuru Family's trio of boutique-chic, exclusive lodging options are the perfect pick for small groups seeking an intimate, totally tailor-made bush adventure. Half wild, half unabashedly posh, the getaway is less than a four-hour drive - or an even shorter charter plane ride - from Johannesburg. Choose between the Owners House, the Lodge or the Farm, and the the only people you'll share sundowners and lion cub photos ops with will be the pack you arrived with. Family-friendly and super flexible, this is a true South African safari vacation, complete with personal cooks, butlers and animal trackers at your service.

Click here to preview sale

Starting Saturday 6/8 at 5pm BST

Sales this week

Starting Today at 8pm BST
Mamaison Hotel Budapest
Sofitel Montreal Golden Mile
Cervo - Switzerland

Starting Thursday at 8pm BST
The Shores - Daytona Beach
The Raleigh - South Beach
Shorebreak - California

Starting Friday at 5pm BST
Veranda House - Nantucket

Starting Friday at 8pm BST
Iron Horse Hotel - Milwaukee
Hidden Pond - Maine
Kedron Valley Inn - Vermont

Starting Saturday at 5pm BST
A Culinary Retreat in Mexico
Morukuru - South Africa
Skydive Mount Everest

Starting Sunday at 5pm BST
The Alexandra - Turks & Caicos

Starting Sunday at 8pm BST
Las Alamandas - Mexico
Arenas del Mar Beachfront
Blue Waters - Antigua
Nayara Hotel, Spa & Gardens

Starting Monday at 8pm BST
Hotel Matilda - San Miguel
Santa Teresa - Rio De Janeiro

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HED: To Venice With Love, Peggy Siegal

DEK: Back to northern Italy to take in the arts and architecture—and of course, film at the 68th annual Venice Film Festival.

By: Peggy Siegal

Tuesday, Aug. 30, 2010

Art collector, polo player and film producer Peter Brant gives me a ride to the 68th Venice Film Festival to mingle with Hollywood glitterati from around the world. Venice, the thousand-year-old city looks like a movie set floating on the water that has been the backdrop for films from Casanova to The Tourist. This year, 65 films will have world premieres. Among the jury are two American directors: chairman Darren Aronosfky, Todd Haynes and one English musician, David Byrne.

Wednesday, Aug. 31, 2011

I check into the paparazzi-proof Cipriani's on the private Giudecca Island for a week—a safe haven for George Clooney, Al Pacino and Gwyneth Paltrow. Cipriani's is impossible to book I have been told for months that Friday night is sold out.

In Italy, George Clooney, aka “King George,” is presiding over his Ides of March press conference at the Palazzo del Casino on Lido. He rules himself out of a future role as United States President, citing Barack Obama's troubles are reason enough to avoid the job. How many countries can George rule?

Clooney currently serves as producer, director, co-writer and actor. He seriously tries to explain why his film now reflects the present cynical political mood of the country. The press cannot help asking silly questions and setting George up for one wisecrack after another.

Also on the panel are producer Grant Heslov and Beau Willimon who wrote the play the film is based on, Farragut North. Paul Giamatti, Philip Seymour Hoffman, Marisa Tomei and Evan Rachel Wood are confident they are sensational in this Machiavellian, political thriller and try not to joke around. George's infectious humor prevails and the conference is reduced to a Friars roast.

Ryan Gosling, last seen in Blue Valentine, who is filming in the states, is finally this year’s breakout star stealing Clooney’s film.

At the premiere on the Lido at the Palazzo del Cinema, Marco Muller, artistic director of the festival, greets 50-year-old heartthrob Clooney with 45-year-old bombshell Cindy Crawford dressed in long bright red Roberto Cavalli gown exactly matching the red carpet. 23-year-old Evan Rachel Wood steps out in a white Alessandra Rich gown, slit all the way up the middle, exposing her endless legs.

Royal George later holds court with his cast back at Cipriani's. Attempting to handle the sweltering humidity, ties are loosened, drinks are poured while Evan Rachel Wood takes the microphone with a back-up jazz quartet belting out Janis Joplin songs. She transforms herself into a gyrating, pulsating soul

sister as Robin Wright, Christoph Waltz, Diane Kruger and Sir Norman Foster watch in awe. Remember, Evan sang in Julie Taymor's Across the Universe.

By 2 a.m. Ms. Wood is drenched and jumps into Cipriani's Olympic-size pool to cool off in her borrowed gown. She has the dress cleaned the next day and sends it back good as new.

Thursday, Sept. 1, 2011

George heads for the 38th Telluride Film Festival to attend his tribute program introduced by Ken Burns. Fox Searchlight premieres Alexander Payne's Hawaiian-set The Descendants. George stars as a father of two who learns about his wife's infidelity. You have to love the role-reversal casting. Nobody cheats on George—which is why his performance is so poignant.

Clooney and Payne met at the Toronto Film Festival two years ago and were shooting in Oahu months later. Payne edited the film at Clooney's Italian villa on Lake Como, where the entire cast, including Charlie Rose who has a cameo playing Charlie Rose, end up for a holiday reunion the weekend before this year's festival.

Activities include George and Grant challenging Charlie and Marisa Tomei to a strenuous game of hoops on the private basketball court. Late-night partying ends with Mr. Rose skinny-dipping in Lake Como—a tradition started by that wild and crazy guy Walter Cronkite years ago.

The Weinstein Company screens in Venice and Telluride their silent film The Artist, directed by Michel Hazanavicius and starring French movie idol Jean Dujardin. The film was premiered in May at the Cannes Film festival.

Early Oscar buzz for films and male lead performances could be The Descendants, The Artist and Shame. This momentum has to sustain itself on the long road to Eddie Murphy's opening dialogue on Oscar night in February.

Next to Evan Rachel Wood's favorite pool, I am lunching and munching on pasta and pizza with Valentino, Giancarlo Giammetti, Bruce Hoeksema, Charlene de Ganay and Carlos Souza aka "the family."

Paul Giamatti, whose family changed their spelling, tells me he is actually related to Valentino's business partner Giancarlo Giammetti, which is a visual stretch of the imagination.

Valentino has brought his yacht T.M. Blue One carrying six pugs to Venice to attend Madonna's premiere of W.E., the compelling romance between King Edward VIII and the twice-divorced Wallis Simpson.

Madonna has shown an early cut on DVD to Valentino in his grand Paris apartment last spring. Valentino loves the film and says Andrea Riseborough, who was trained at the Royal Academy of Dramatic Arts, is as compelling as Wallis.

Similarities between Madonna and Wallis: Americans hounded by the press, moved to London to marry Englishman, were fashion icons always re-inventing themselves and were possessed with a faint sense of being misunderstood.

After the premiere, Frida Giannini, creative director of Gucci, and Harvey Weinstein host a slightly decadent, secret, after-party on the outside terrace at the Bauer Palazzo. The 53-year old Material Girl brings Brahim Zaibat—her 24-year old break-dancing boyfriend—sips bellinis and sings "Like a Virgin" until 4:30 a.m. to Valentino and Guy Oseary and her cast: Andrea Riseborough, Abbie Cornish, James D'arcy and Oscar Issac, who is also in the Cannes-winner Drive.

Simultaneously, Sony Picture Classic's Michael Barker and Tom Bernard premiere Roman Polanski's Carnage, based on Yasmina Reza's French play God of Carnage, which played to packed houses in Paris, London, New York and Los Angeles.

Curvaceous Kate Winslet, appearing in three films at the festival (Carnage, Mildred Pierce and Contagion), makes her red carpet debut—whipping out her mobile phone and photographing the fans. Fresh from fighting fires and saving lives on Richard Branson's Necker Island, she is joined by bearded co-stars Christoph Waltz and John C. Reilly.

Polanski is in Gstaad. He remains a wanted man in the U.S., and although he avoided an extradition charge last year, he still risks arrest in some parts of Europe. Carnage, filmed in "real time" is a 79-minute actor's showcase set in one room in a Brooklyn apartment shot entirely in Paris.

Mid September, two years after Polanski was arrested en route to the very same Zurich Film Festival, he will return to receive a lifetime achievement award.

At the Carnage dinner Kate talks about portraying a neurotic wife and mother who gets drunk at a civilized sit-down and projectile vomits between two couples discussing their sons schoolyard fight. Kate tells me the vomit was actually squashed banana, oatmeal and molasses that Roman would lick between takes for comic relief.

Mildred Pierce's HBO gang, including Kary Antholis, director Todd Haynes and co-stars Guy Pearce and Evan Rachel Wood are at Kate's table digesting this information.

Kate and Guy later win Emmy's.

Friday, Sept. 2, 2011

Today is the day Cipriani's is over-booked and they are hell bent on tossing me into the canal. No queen-size bed, nor cot, nor couch materializes. Peter Brant is renting half of the Bauer Palladio next door because even he could not get into my oasis with all of his kids. The bed Peter promised me for tonight has been quietly given away to Owen Wilson, who surprisingly arrives on Larry Gagosian's plane this morning. Peter heroically rescues me by finding a suite in his hotel with double-the-height ceilings for a gazillion Euros.

With the noon toss-out and luggage left in Cipriani's lobby, I race to the press screening of Sony Pictures Classics and Canadian David Cronenberg's highly anticipated A Dangerous Method, produced by Jeremy Thomas.

The film, set on the eve of World War I, is about Sigmund Freud and Carl Jung and their patient Sabina Spielrein, the Russian Jewess who for years remained uncredited for her influence on the development of modern psychology.

The cast features Michael Fassbender as Jung with Keira Knightley (queen of the costume dramas) as Spielrein. Yes, they are fully dressed in their famous sexually charged spanking scenes. This is just the warm up to Fassbender's raw and disturbing sexual romp through lower Manhattan on Sunday night in Shame, Jeremy Thomas's other film. Viggo Mortensen portrays Freud, Vincent Cassel is Austrian psychoanalyst Otto Gross and newcomer Sarah Gadon is Jung's wife.

At the press conference the cast jokes about drawing from their own madness as research and inspiration. I, on the other hand, am in a panic speeding back to Cipriani's to wheel my suitcases around the corner to the Bauer Palladio. Looking lost, dejected and pathetically disheveled, I thank God no one sees my fall from grace.

I eventually realize I am missing a pair of small gold and diamond earrings. Oddly, the same thing happened to me last year during a room change. I chalk this up as the price of foolishly traveling with real jewelry.

At the premiere of A Dangerous Method, I am stressed because I have no ticket, having given my pair to Peter Brant and bed-robber Owen Wilson. Michael Barker and Tom Bernard escort me on the red carpet and Marco Muller himself walks me in.

Having seen A Dangerous Method this morning, I slip out and head to the first Gucci for Woman Award in Cinema dinner hosted by Frida Giannini in Cipriani's rustic barns previously ancient granaries, now donning elegant white Murano glass chandeliers.

This new award recognizes outstanding female filmmakers. The jury includes Robin Wright (who heads to Toronto next week to the premiere of Bennett Miller's Moneyball) and James Franco, also Toronto bound with Sal about Sal Mineo, and Valeria Golino, whom I met on Rain Man.

Madonna asks for "a drum roll, please," as she announces winner Jessica Chastain for Tree of Life . . . but it might as well be for the 11 films Chastain has made since being discovered by Al Pacino four years ago for Wilde Salome. Jessica is presently in The Help, The Dept, Take Shelter and Texas Killing Fields. She is also Toronto bound with Ralph Fiennes' Coriolanus. This Julliard graduate is following in footsteps of the iconic Meryl Streep.

Francois-Henri Pinault, chairman of Gucci's parent company PRP, is headed to China to support their medical and educational foundations. Pinault's wife Salma Hayek, wearing a Gucci gown embellished with crystals and feathers, discusses Oliver Stone's Savages, the film about Mexican drug lords that she is currently filming in Los Angeles.

Suddenly a cake with sparklers appears for Salma's 45th—and Madonna encourages us to belt out "Happy Birthday. Singing along is Ginevra Elkann, CAA's Hylda Queally, manager Jason Weinberg and the Brant boys, 18-year-old Petey and 15-year-old Harry.

Across the canal Luca Dini, editor of Vanity Fair Italy is hosting a dinner for David Cronenberg at the pink, Gothic, fifteenth-century Palazzo Pisani Moretta with original period furnishings. An official guidebook says, "can rent out for sumptuous receptions and unforgettable parties." They are not kidding. Lit exclusively by candles mounted on hundreds of antique Murano glass chandeliers, the palace has no electricity or air conditioning. Venice is in the middle of a heat wave and at midnight it still feels like a sauna. Add 300 film patrons frantically fanning themselves with gifted fans, eating hot risotto and ravioli, and you have the hottest party I've ever been to. Literally. Keira, in her long-sleeved, gold lace Valentino is dabbing her body with ice water from the table.

Ironically a party for Contagion the following night had a dozen new, huge, white plastic air conditioners humming around the ballroom for the film about a global, pandemic plague.

Saturday, Sept. 3, 2011

With a noon checkout and a 3 p.m. check-in at Cipriani's, I am beside myself with packing fatigue and blowing $500 dollars a day on boat rides.

I am watching Steven Soderbergh's sleek medical thriller Contagion aka Sars: The Movie with the A-list Hollywood cast including Matt Damon, Gwyneth Paltrow, Laurence Fishburne, Jennifer Ehle, Jude Law and Marion Cotillard. Michael Shamberg produces and Scott Z. Burns is the screenwriter. The film imagines a virus killing millions as scientists try desperately to find an antidote. It starts with peaky-looking Paltrow in a casino touching everything, chatting on a cell phone to a lover, coming home to her husband and expiring on the kitchen floor as she foams at the mouth. Gwyneth tells us this is accomplished by biting down on an alka-seltzer.

Next I find the documentary Diana Vreeland: The Eye Has to Travel hidden in a tiny screening room in a basement. Lisa Immordino Vreeland, married to Vreeland's grandson Alexander produces and directs. Clips from Vreeland's early life, career and family, visuals of her years at Harper's Bazaar, Vogue and the Metropolitan Museum of Art's Costume Institute along with interviews with Diane Sawyer, Andy Warhol, Calvin Klein, Oscar de la Renta and John Fairchild show a woman with a keen respect for cultural history and an original sense of style.

On to lunch in honor of Lisa at Harry's Bar hosted by Diego Della Valle, President of the Tod's Group and Italian Vogue's Franca Sozzani. Lisa's husband Alexander and father Nichlos join Jessica Chastian, Eli Roth, Bar Rafaeli, Shala Monroque, Bianca Brandolini d'Adda and Countess Bianca Arrivabene.

Once again I am sweating and wheeling all of my luggage back to Cipriani's, praying I do not run into pregnant Beyonce celebrating her 30th birthday with husband Jay-Z. Finally, I am settled into a pool-side suite

Sunday, Sept. 4, 2011

Press are lining up at 8 a.m. for the 9 a.m. screening of the steamy, evocative festival "it" film, Shame, directed by Steve McQueen, not the deceased white actor known for posing on a motorcycle, but a African Englishman who took the performer's name as his own. Michael Fassbender plays the tormented

30-something addicted to sex. Carey Mulligan is the wayward sister who moves into his apartment fostering chaos. She sings a chilling, slow sad blues version of "New York, New York" which was shot in the Boom Boom Room of the Standard Hotel. Ian Canning and Emile Sherman, producers of The King's Speech, sold this to Fox Searchlight, who will face the challenge of releasing a NC-17 movie.

I am backstage in the green room with Al Pacino—*the* Merchant of Venice—moments before he enters a packed pressroom to discuss Wilde Salome, his passionate documentary and feature mélange based on Oscar Wilde's play, the biblical tale of Salome and King Herod which explores the destructive use of sexuality. From biblical times to the Boom Boom Room—it's a big day for dysfunctional, obsessive sex.

Al, wearing a white silk loose shirt and sporting longish hair, looks like an escapee from Scarface. Jessica Chastain is about to explain her slithering, almost nude red scarf dance for King Herod. Al asks his second agent to write an acceptance speech for the Jagger-Le-Coultre Glory to Filmmaker Award he is to receive tonight.

The agent stays calm but clearly does not have a clue who to email in Hollywood for help. Al eventually realizes he will go on stage tonight and wing it. Now, the Italian press goes nuts as their hometown boy, Michael Corleone, makes his way to the podium. I saw this exact, almost religious, reverence last year when Sophia Coppola was in this pressroom for Somewhere. The Godfather is Italy's sacred film and its filmmakers are their cinema saints. Al passionately charms his worshipers. As his entourage is escorted out of the building to the waiting water taxi past screaming fans, one zealous guy jumps into the canal swimming and chanting "Al" "Al" "Al," with his arms in the air just like "Attica" "Attica" "Attica," in Dog Day Afternoon. Al waves back.

Al's post-premiere dinner is at the Palazzo Grassi, built in 1740 and is now owned by Francois Pinault and used to exhibit his art collection. This is also where Amy Sacco transforms the lobby into her late-night, pop-up Bungalow 8 every evening.

Al, with his luscious Argentinean Lucila Sola, along with producer Barry Navidi and entourage, end up poolside at Cipriani's eating bowls of pasta and ice cream. Gary Oldman, Laurence Fishburne, Peter Brant and Owen Wilson pay respects. Owen receives praise for Midnight in Paris. Princess Firyal of Jordan wants Al to pose for a photo with her niece. Even Joel Arthur Rosenthal, the reclusive, Parisian jewelry designer aka JAR, who's also known for accessorizing everyone from Elizabeth Taylor to Ellen Barkin is thrilled to meet Al.

Monday, Sept. 5, 2011

My ride to Venice is now going home via Geneva and Moscow without me.

Literary agent Lynn Nesbit and I go the premiere of Focus Feature's/John le Carre's Tinker, Tailor, Soldier, Spy. English producer Tim Bevans, Swedish director Tomas Alfredson and John le Carre with their cast Gary Oldman, Colin Firth, John Hurt, Mark Strong and newcomer Benedict Cumberbatch, get standing ovations before and after the film from the spotlighted balcony. Missing is Tom Hardy, this year's hottest young actor.

After Tinkers' dinner, we head back to Cipriani's to Charles Finch and producer Ed Pressman's evening with Caroline Scheufele, Co-President of Chopard to celebrate The Moth Diaries. Lynn represents Rachel Klein, author of the bestselling book. We dine with director Mary Harron and her young actresses Sarah Gadon and Sarah Bolger. Missing is Lily Cole. Her flight is cancelled due to the national one-day labor strike.

Tuesday, Sept. 6, 2011

Following the screenings of The Moth Diaries and a new version of Wuthering Heights with an African Heathcliff, I join Pressman and his cast of The Moth Diaries for lunch at the Excelsior. Jonathan Demme comes by. He is here with the post-Katrina New Orleans-set documentary, I'm Carolyn Parker: The Good, the Mad, and the Beautiful.

While housekeeping packs my clothes, I conclude that this is the year Hollywood embraces launching their Oscar-bound films oversees. The race began in May on the beaches of Cannes where Midnight in Paris and The Artist debuted with black-tie galas nightly.

Late August, American and English films dominate the Venice waterfront where Shame heats up amid more fancy parties in grand palazzos.

Tiny Telluride, now showing more European films was the next stepping stone with a Western hometown casualness.

September was Toronto, the mother of all film festivals that premieres its new exhibition space, the Bell Lightbox and a smorgasbord of 250 films. Here was the most user-friendly, fashion-free film festival where one walked to four films a day. Moneyball brings Brad Pitt to town, who brings Angelina Jolie. International stars end up at the Soho House whispering about "the race."

Early October is at Lincoln Center, home of The New York Film Festival that shows films that have debuted in the other festivals and await sanctioning from the American media and public. The academy members are yet to weigh in.

One ends up with the exhilarating feeling of experiencing world cinema through passionate festival curators giving support and clarity from directors to distributors and helping simple film fans like you and me. Let's not forget the geniuses, Steven Speilberg, Stephen Daldry, Clint Eastwood, David Fincher, Martin Scorcese and Jason Reitman who have bypassed the festival route. Let the race begin.

Evilicious

Explaining our taste for excessive harm

Marc D. Hauser

Viking/Penguin

For Jacques and Bert Hauser,
my parents,
my friends,
and my reminder
that life should be
lived to its fullest

HOUSE_OVERSIGHT_012748

Pleasure is the greatest incentive to evil.
— Plato

To witness suffering does one good, to inflict it even more so.
— Friedrich Nietzsche

Man produces evil as a bee produces honey.
— William Golding

HOUSE_OVERSIGHT_012749

Dear reader,

Having lived in Uganda and spoken with people who escaped from the savagery of the brutal dictators Milton Obote and Idi Amin, having heard stories of my father's childhood as a Jew running through Nazi occupied France, and reading past and present-day accounts of genocide, I am familiar with the horrors of evil. I have also been a student of human nature, trained as a scientist. These experiences have propelled me to study the causes of evil, attempt to make some progress in explaining it to myself, and hopefully to you. There is a great urgency to understanding this problem. None of us can afford to passively watch millions of individuals lose their homes, children, and lives as a result of malice. Sloth is a sin, especially when we live in a world where cultures of evil can so easily erupt.

I am also familiar with and deeply moved by human kindness, our capacity to reach out and help strangers. When my father was in a boarding school in the south of France, hiding from the Nazis, a little girl approached him and asked if he was Jewish. My father, conditioned by his parents to deny his background, said no. The girl, sensing doubt, said "Well, if you *are* Jewish, you should know that the director of the school is handing Jewish children over to the Nazis." My father promptly called his parents who picked him up, moved him to another village and school, and survived to tell the story. This little girl expressed one of our species' signature capacities: the ability to show compassion for another person, even if their beliefs and desires are different.

In preparation for writing this book, I read transcripts and descriptions of thousands of horrific events, listened to personal stories of survivors from financial ruin and war, worked with abused children who were crucified by unfit parents, and watched both fictional films and documentaries that portrayed psychopaths, dictators of totalitarian regimes, and their hapless victims. As one often does in these circumstances, I developed a tougher skin over time. But I have never lost track of the human travesties that result from evil. As my father's story suggests, I have also not lost sight of the fact that we are a species that has done great good, and will continue to do so in the future. Nonetheless, to provide a sound and satisfying explanation of evil we must avoid falling into more romantic interpretations of the human condition. Our best protection is science. This is the position I will defend.

The topic of evil is massive. This is, however, a short book, written without exhaustive references, in-depth descriptions of our atrocities, and comprehensive engagement with the many theories on offer to explain evil. What I offer is my own explanation of evil, of how it evolved, how it develops within individuals, and how it affects the lives of millions of innocent victims. It is a minimalist explanation of evil that is anchored in the sciences. I believe, as do many scientists, that deep understanding of exceptionally complicated phenomena requires staking out a piece of theoretical real estate with only a few properties, putting to the side many interesting, but potentially distracting details. This book extracts the core of evil, the part that generates all the variation that our history has catalogued, and that our future holds.

Sincerely,

HOUSE_OVERSIGHT_012750

Acknowledgements

I wrote this book while my cat, Humphrey Bogart, sat on my desk, staring at the computer monitor. Though he purred a lot, and was good value when I needed a break, he didn't provide a single insight. Nor did our other pets: a dog, rabbit, and two other cats. For insights, critical comments on my writing, comfort, and endless love and inspiration, there is only one mammal, deliciously wonderful, and without an evil bone in her body — my wife, Lilan.

Marc Aidinoff … a Harvard undergraduate who joined me early on in this journey, digging up references, collecting data, arguing interpretations, sharing my enthusiasm, while offering his own.

Kim Beeman and Fritz Tsao … my two oldest and closest friends. They have some of the richest minds around. Their knowledge of film, literature and the arts is unsurpassed. Their capacity to bring these riches to the sciences is a gift.

Noam Chomsky… for inspiration, fearless attacks on power mongering, and friendship.

Errol Morris… for heated discussion, camaraderie, and insights into evil through his cinematographic lens and critical mind.

Many colleagues, students, and friends provided invaluable feedback on various parts of the book, or its entirety: Kim Beeman, Kent Berridge, George Cadwalader, Donal Cahill, Noam Chomsky, Jim Churchill, Randy Cohen, Daniel Dennett, Jonathan Figdor, Nick Haslam, Omar Sultan Haque, Lilan Hauser, Bryce Huebner, Ann Jon, Gordon Kraft-Todd, Errol Morris, Philip Pettit, Steven Pinker, Lisa Pytka, Richard Sosis, Fritz Tsao, Jack Van Honk, and Richard Wrangham.

My agent, John Brockman…not only a great agent but a wonderful human being who supported me during challenging times.

My editors at Viking/Penguin, Wendy Wolff and Kevin Doughten. Tough when needed. Supportive when needed. A unique blend. The book is all the better for it.

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Prologue: Evilution

> "There is no such thing as eradicating evil [because] the deepest essence of human nature consists of instinctual impulses which are of an elementary nature… and which aim at the satisfaction of certain primal needs."
>
> ***-- Sigmund Freud***

I was drowning. This was not the first time. It was also not because I was a poor swimmer. I was 14 years old. A boy named Lionel James, who was the same age but twice my size, was shoving my head under water, roaring with laughter as I struggled to gasp some air.

I usually managed to avoid Lionel in the pool, but sometimes he got the best of me while I was playing with friends. Lionel wasn't the only one who bullied me in junior high school. He was part of an evil three pack, including Ronnie Paxton and Chris Joffe, each much larger and stronger than I. Almost daily they locked me inside of the school's lockers, bruised my arms by giving me knuckle-punches, and gave me purple-nurples by twisting my nipples. This was no fun for me. For James, Paxton, and Joffe it was delicious enjoyment. Sometimes, while I was locked in my locker, my math teacher would let me out and then ask "Why do you get yourself into these situations?" Though I had great respect for my teacher's math abilities, and actually had a crush on her, she was socially daft. Did she think I asked to be packaged up in the locker by my tormenters? It was sheer humiliation.

One day my mother noticed the bruises. Horrified, she asked what happened. I reluctantly told her the story. She said we were going to talk with the principal. I told her I would prefer water drip torture. She understood and we never went to see the principal.

The person who rescued me from my misery was my father, a man who had lived through the war as a child, running from village to village to escape the Nazis, and in so doing, confronted thuggish farm boys whose weight far exceeded their IQ. My father, upon hearing that I didn't want to go to school anymore, offered a compromise: he would pick me up for lunch every day if I kept going to classes. I agreed, relishing the idea of escaping the lunch-time scene at school where James, Paxton and Joffe pummeled me at will without getting caught.

HOUSE_OVERSIGHT_012753

A month passed. I felt better. My father told me that it was time to go back to lunch at school, but with a plan, one centered around the notion of respect. The only way to command it from my tormenters was to fight back. "But Dad," I said, "if I hit them, they will crush me." "They might," he said, "but you will have gained some respect, and they may turn their attention to someone else." It seemed like a remarkably stupid idea. But my father lived through a war and fought his way to respect among the thugs in every village school. I decided to give it a go.

I went back to school. Soon thereafter, I found myself standing behind Paxton who displayed biceps bigger than my head. I figured I had only one shot. I tapped him on the shoulder and swung as hard as I could, hitting him square in the chest. What aim. What perfection. What wasted energy. With no more than a flinch, Paxton looked down at me, fury in his face, and grunted "What's up with you?" With tears running and lips trembling, I sputtered "I can't take it anymore. You, Joffe, and James are constantly hitting me and locking me in the lockers. I can't take it!" And then, as if his entire brain had been rewired, serotonin surging to provide self-control, dopamine flowing to shift his sense of reward, the hulk spoke: "Really? Okay, we'll stop." And just like that, Paxton, Joffe and James stopped. No more locker games, no more bruises. They even saw me as a useful resource, someone who could help them pass some of their exams. From victim to victory.

I was fortunate. Many are not. Thousands of children throughout the world are persecuted in a similar way but never fight back or if they do, are crushed for trying. Some are pushed so hard that they commit suicide, tragedies that increasingly make headline news reports.

The fact that bullies often torment their victims for personal gain, cause great harm, and often enjoy the experience — as did Lionel James — fits well with a common view of evil. On this view, we think of someone as evil if they inflict harm on innocent others, knowing that they are violating moral or legal norms, and relishing the abuse delivered. But what of bullies who, due to immaturity or brain deficits, simply don't understand the scope of moral boundaries? What if they impose great harm on their victims, but don't enjoy the experience? What if the victims are not entirely innocent, such as those who double-time as bullies?

We can debate questions like these on philosophical grounds, attempting to refine what, precisely, counts as an act of evildoing as opposed to some mere moral wrong, like breaking a promise or having an affair while married. Many have. I don't believe, however, that this is how we will achieve our deepest understanding. Instead, I turn to the sciences of human nature, focusing on cases where people directly or indirectly cause excessive harm to innocent others as the essence of evil. To explain this form of evil, we must dissect the underlying psychology, the brain circuits that generate this psychology, the genes that build brains, and the evolutionary history that has sculpted the genetic ensemble that makes us distinctively human. This is the approach I pursue. If I'm right about this approach, not only will we gain

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a deeper understanding of how and why our species has engaged in evildoing, but we will learn about our own individual vulnerability to follow suit. This prologue provides a sampling of the central ideas minus the rich evidence and explanations that follow in the four core chapters of this book.

A brief history of malice

Homo sapiens, the knowing and wise animal, has logged an uncontested record of atrocities, despite moral norms prohibiting such actions: no other species has abducted innocent children into rogue armies and then killed those who refused to kill, tossed infants into the air as targets for shooting practice, gang raped women to force them to carry the enemy's fetus to term while destroying the souls of their powerless husbands, and mutilated and burned men to death because more humane forms of killing were less effective and enjoyable. These are horrific acts. They abound globally and across the ages. Many scholars have judged them as evil.

Despite the pervasiveness of these atrocities, evil is commonly perceived as a defect, an unfortunate malignancy that has engulfed and metastasized within our species' essential goodness. Evil is also denied, relegated to mythology, the delusional imagination of a few madmen, the propaganda of imperialist nations, or the result of a rare mutation. Perhaps because of these impressions, we have an obsessive fascination with evil, evidenced by our fertile capacity to create and then consume films about genocide, cunning rapists, master criminals, corporate raiders, psychopaths and serial killers. We are of two minds, wanting to hide from the atrocities of evil while feeding our insatiable appetite for more.

To understand evil is neither to justify nor excuse it, reflexively converting inhumane acts into mere accidents of our biology or the unfortunate consequences of bad environments. To understand evil is to open a door into its essence, to clarify its causes. In some cases, understanding may force us to exonerate the perpetrators, recognizing that they harbored significant brain damage and as a result, lacked self-control or awareness of others' pain. In other cases, understanding will reveal that they knowingly caused harm to innocent others, relishing the devastation left behind. By describing and understanding an individual's character with the tools of science, we are more likely to make appropriate assignments of responsibility, blame, punishment, and future risk to society.

To understand evil requires facing our species' sustained record of atrocities, laying out a variety of cases for inspection. Former Reverend Lawrence Murphy was responsible for over two hundred instances of sexual abuse, luring innocent deaf children in with a saintly smile. Charles Manson, the illegitimate son of a sixteen year old woman and the self-proclaimed father of dozens of runaway women, was responsible for the brutal death of five people by means of 114 knife jabs, while also prostituting his

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lovers, beating his wife, selling drugs, and stealing cars. Former Chairman of the NASDAQ stock exchange, Bernard Madoff, was responsible for initiating a Ponzi scheme involving money laundering, perjury, and mail fraud that caused thousands of people to suffer financial ruin. Jane Toppan, born Honora Kelley, was an American nurse who was responsible for killing over 30 patients by drug overdose, stating in her testimony that she experienced a sexual thrill when she held dying patients, and that her goal in life was to kill more innocent people than anyone else in history. Former military specialist Charles Granger was responsible for forcing nudity and sex among the Iraqi prisoners of Abu Ghraib, putting individuals on dog leashes, depriving them of their senses with head bags, and piling naked bodies into photographed still lifes, orchestrations that led to the ultimate humiliation and dehumanization of these prisoners.

Depending upon how we think about the problem of evil, we might consider the individuals noted above as minor evildoers or not evil at all because the harms were rather insignificant, because their goal wasn't to directly harm anyone and then enjoy the trail of damage, or because they lacked the mental capacity to assume responsibility for the atrocities committed. These individuals pale in comparison with the most unambiguously radical evildoers of the 20-21st century — the dictators Idi Amin, Francisco Franco, Adolf Hitler, Kim Jong-il, Slobodan Milosevic, Pol Pot, Josef Stalin, Charles Taylor, and Mao Zedong. These men were responsible for the brutal deaths of approximately 80 million people combined. Most were mentally healthy, at least in terms of clinical diagnoses. Many relished their atrocities. All devised over-the-top means of ending lives. Whether by enticing or coercing their followers to torture, gang rape, and butcher human flesh, they went beyond what was necessary to get rid of unwanted others. These are excessive harms, carried out with excessive techniques. In this book, I will not only explore these extreme cases, but more mundane ones as well. Each case helps shape our understanding of what propells some individuals to cause harm on small or large scales, while others avoid it entirely, despite temptations to the contrary.

Why and How?

To explain the landscape of human atrocities, from Reverend Lawrence Murphy to Mao Zedong, we need an account of why we evolved this capacity and how it works. I will explain both of these problems using the theories and evidence of science.

Why? *Evil evolved as an incidental consequence of our unique form of intelligence.* All animals show highly specialized abilities to solve problems linked to survival. Honey bees perform dances to tell others about the precise location of nutritious pollen, providing an information highway that lowers the

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costs of individual foraging challenges. Meerkats teach their young how to hunt dangerous but energy-rich scorpion prey, providing an education that bypasses the risks of trial and error learning. Humans unconsciously wrinkle their noses and pull back their lips into an expression of disgust that communicates information about disease-ridden and toxic substances, thereby lowering the costs of sickness to others who might be exposed. Each of these specializations involve exquisitely designed neural circuits and sensory machinery. Each specialization is used for one and only one problem — except in humans. Animal thoughts and emotions are like monogamous relationships, myopically and faithfully focused on a single problem for life. Human thoughts and emotions are like promiscuous relationships, broad-minded and liberated, free to couple as new problems surface.

Unlike any other animal, the thoughts and emotions we use to solve problems in one domain can readily be combined and recombined with thoughts and emotions from other domains. This is powerful, providing great flexibility in addressing novel problems, some of which we create for ourselves. Disgust provides an example. Disgust originally evolved as an adaptive response to detecting substances that are toxic to our health, especially substances that are outside of the body but should be inside: feces, urine, blood, and vomit. Within the circulation of a promiscuous brain, however, disgust journeys to distant problems, including the moral attitude of vegetarians toward meat eaters, our revulsion toward incest, and abhorrence of gratuitous torture. This journey involves the same brain mechanism that serves original disgust, together with new connections that give voice to our moral sense. Promiscuity enables creativity.

What the sciences reveal is that the capacity for promiscuous thinking was realized by evolutionary changes in the number of newly wired up brain areas. By increasing these connections, it was possible, for the first time, to step outside the more narrow and specialized functions of each particular brain area to solve a broader range of problems. Though we don't know precisely when these changes occurred, we know they occurred after our split from the other great apes — the orangutans, gorillas, bonobos and chimpanzees. We know this from looking at both the brains of these species, as well as the ways in which they use tools, communicate, cooperate, and attack each other. Not only are there fewer connections between different regions of the brain, but their thinking in various domains is highly monogamous, faithfully dedicated to specific adaptive problems.

Empowered by our new, massively connected and promiscuous brain, we alone migrated into and inhabited virtually every known environment on earth and some beyond, inventing abstract mathematical concepts, conceiving grammatically structured languages, and creating glorious civilizations rich in rituals, laws, and beliefs in the supernatural. Our promiscuous brain also provided us with the engine for evil, but only as an incidental consequence of other adaptive capacities, including those that evolved to harm others for the purpose of surviving and reproducing.

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All social animals fight to gain resources, using highly ritualized behaviors to assess their opponents and minimize the personal costs of injury. Changes in hormone levels and brain activity motivate and reward the winners, and minimize the costs to the losers. In a small corner of the landscape of aggressive fighting styles are an elite group of killers, animals that go beyond harming their opponents to obliterating them: ants, wolves, lions, and chimpanzees. When these species attack to kill, they typically target adult members of neighboring groups, using collaborative alliances to take out lone or otherwise vulnerable victims. The rarity and limited scope of this form of lethal aggression is indicative of monogamous thinking, and tells us something important about the economics — especially the costs and potential rewards of eliminating the enemy, as opposed to merely injuring them. Killing another adult is costly because it involves intense, prolonged combat with another individual who is fighting back. The risks of significant personal injury are therefore high, even if the potential benefit is death to an opponent. As the British anthropologist Richard Wrangham has suggested, animals can surmount these costs by attacking and killing only when there is a significant imbalance of power. This imbalance minimizes the costs to the killers and maximizes the odds of a successful kill. Still, the rarity of killing reinforces an uncontested conclusion among biologists: all animals would rather fight and injure their opponents than fight and obliterate them, assuming that obliteration is costly to the attacker. In some cases, we are just like these other animals — killophobic.

Historical records, vividly summarized by Lieutenant Colonel Dave Grossman in his book *On Killing,* reveal that in some situations, soldiers avoid killing the enemy even though they could have. For example, despite the fact that Civil War regiments had the potential to kill 500-1000 individuals per minute, the actual rate was only 1-2 per minute. This suggests that under some conditions, killing another when you can see the whites of their eyes is hard. But as the history of genocides reveal, we have evolved ways to bypass this limitation, making us killophilic in a variety of situations. Our brain's unique capacity for denial is one of the liberating factors.

By recruiting denial into our psychology's artillery, we invented new ways of perceiving the enemy or creating one, distorting reality in the service of feeding a desire for personal gain. Denial, like so many aspects of our psychology, generates beneficial and toxic consequences. Self-deceiving ourselves into believing that we are better than we are is a positive illusion that often has beneficial consequences for our mental and physical health, and for our capacity to win in competition. Denying others their moral worth by reclassifying them as threats to our survival or as non-human objects is toxic thinking. When we deny others their moral worth, the thought of killing them is no longer aversive or inappropriate. If we end someone's life in defense of our own, we are following our evolved capacity for survival. When we destroy a parasite, we are also protecting our self-interests to survive. And when we destroy an inanimate object or lock it away, there is no emotional baggage because we have bypassed the

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connection to individual rights; we have cut out morality as the governor. This suite of transformations, enabled by our promiscuous brain, allowed us to occupy a unique position within the animal kingdom as large scale killers.

Chimpanzees only kill adults when there are many attackers against one victim, with the vast majority of kills focused on individuals outside of their own group; most kills within the group are aimed at infants, where the costs to the attacker are low. Though humans also kill members of enemy groups when there are many against one — a pattern that is common among hunter-gatherers and other small-scale societies — we depart from this narrow pattern in terms of numbers and the array of potential victims. When humans kill, we go at it with many against many, one against one, and even one against many, including as victims both those outside of our group and those within, young and old, same and opposite sex, and mating partner and competitor.

Add the chimpanzee's adaptive capacity for coalitionary killing to the promiscuous capacity of the human brain, and we arrive at a uniquely aggressive species, one capable of inflicting great harm on others in any context. Though the modern invention of scud missiles and stealth bombers undoubtedly enriched our capacity to kill on a large scale by putting distance between killers and victims, these weapons of mass destruction were not necessary. Today, we need only travel back a few years to 1994 to witness the machete genocides of Rwanda, a painful memory of our capacity to wipe out close to a million people in 100 days with hand to hand combat. This is excessive harm, enabled by our ability to use denial to minimize the perceived costs of killing another person and to motivate the anticipated benefits. Denial turns down the heat of killing another and turns us into callous predators.

Evolutionary changes in the connections to the brain's reward system provided a second, cost-offsetting step, allowing us to move into novel arenas for harming others. When an animal wins a fight, the reward circuitry engages, providing a physiological pat on the back and encouragement for the next round. This same circuitry even engages in anticipation of a battle or when watching winners. The reward system is important as it motivates competitive action in situations that are costly. There is one situation, however, where the reward system is remarkably quiet, at least in all social animals except our own: detecting and punishing those who attempt to cheat and free-ride on others' good will.

Punishment carries clear costs, either paid up front in terms of resources expended on physically or psychologically attacking another, or paid at the end if the victim fights back or retaliates. These costs can be offset if punishers and their group benefit by removing cheaters or teaching them a lesson. Among animals, punishment is infrequently seen in vertebrates, especially our closest relatives the nonhuman primates. When it is seen, the most common context is competition, not cooperation. Like lethal killing, then, punishment in animals tends to be restricted to a narrow context. Like lethal killing, punishment in animals is psychologically monogamous.

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Punishment in humans is emblematically promiscuous. We castigate others whenever they violate a social norm, in both competitive and cooperative situations, targeting kin and non-kin. Punishment is doled out by the individual directly harmed and also by third party onlookers. We use both physical and non-physical means to discipline cheaters, including ostracism. Punishment's landscape is vast.

The idea I develop here, building on the work of scholars in economics, psychology, and anthropology, is that our species alone circumvented the costs of punishment as an incidental consequence of promiscuity, including an intimate coupling between the systems of aggression and reward. As several brain imaging studies reveal, when we either anticipate or actually punish another, or even witness punishment as a mere bystander, our reward circuitry delivers a honey hit. Delivering just deserts, or watching them delivered, is like eating dessert. We absorb the costs of punishment by feeling good about ratting out the scourges, banishing them from society, and sometimes from life itself. Ironically, as the economist Samuel Bowles has suggested based on mathematical models and a synthesis of the historical record, punishment can strengthen solidarity and cooperation within the group, while simultaneously enhancing antagonism and prejudice toward those outside the inner sanctum. Ironically, the psychology that benefited cooperation among like-minded others may also have functioned to destroy those who have different beliefs and values.

The emergence of promiscuous punishment was a momentous event in human history, a celebration of exquisite brain evolution and adaptive design. But this achievement carried a hidden cost, a debt that we continue to pay: A mind capable of feeling good about punishing in the name of virtue is a mind capable of doing bad to feel good. It is a mind that finds real or simulated violence entertaining and seeks ways to satisfy this interest. It is a mind that enjoys watching others suffer while singing O Schadenfreude. It is a mind that is capable of feeling good about killing others who are perceived as parasitic on society. It is a mind that can override the anticipated costs of killing by fueling a taste for killing.

Desire, denial, aggression and reward are each associated with specific psychological processes, distinct evolutionary histories, and specific adaptive problems. When processed by a promiscuous brain, these systems connect in ways that are both beneficial to human welfare and deeply deleterious.

How? *Evil occurs when individuals and societies allow desire for personal gain to combine with the denial of others' moral worth to justify the use of excessive harms.* Everyone has desires, resources they want and experiences they seek. Our desires motivate us into action, often to fulfill personal needs or to help others. We all desire good health, fulfilling relationships, and knowledge to explain the world. Some also desire great wealth and power, each culture weighing in on its signature vision of what counts: money, land, livestock, wives, and subordinates. The desire system motivates action in the service of

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rewarding experiences. Some actions have benign or even beneficial consequences for the welfare of others, while others have malignant and costly consequences.

Exquisite studies pioneered by the American cognitive neuroscientist Kent Berridge have uncovered the core elements of pleasure, including distinctive systems of wanting, liking and learning. We, and hundreds of other species, often want things we like, and like things we want. This is, obviously, an adaptive coupling. Thanks to experiments at the level of genes, neurons, and behavior, we can tease apart these three systems. Thanks to naturally occurring situations, we can watch these systems come unglued over the course of addictions, leading to the paradoxical and maladaptive situation of wanting more and more, but liking the experience less and less. Addictions, as archetypal examples of excess, provide a model for thinking about evil and its trademark signature of excessive harm.

The paradoxical decoupling between wanting and liking is seen most clearly in studies of obesity in rats and humans, where individuals develop skyrocketing desires for food, but fail to experience comparable pleasure from eating. By definition, those who become obese are prone to eat in excess. One reason they do is because eating, or even seeing images of food, no longer delivers the same honey hit to the brain as in their pre-obesity days. The reward system turns off when we turn to excess. This is adaptive because nothing in excess is good. But because the wanting system runs independently, the adaptive response by the liking system has the unfortunate consequence of making us want more even though we enjoy it less. The proposal I develop in this book is that the same process is involved in evil, especially its expression of excessive harm. It is a process that is aided by denial.

Everyone engages in denial, negating certain aspects of reality in order to manage painful experiences or put forward a more powerful image. But like desire, denial has both beneficial and costly consequences for self and others. When we listen to the news and hear of human rights violations across the globe, we often hide our heads in the sand, plug our ears, and carry on with our lives as if all is okay on planet Earth. When doctors have to engage in slicing into human flesh to perform surgery, they turn off their compassion for humanity, treating the body as a mechanical device, at least until the surgery is over, and the patient awakes, speaks and smiles. When we confront a challenging opponent in an athletic competition or military confrontation, we often pump ourselves up, tricking our psychology into believing that we are better than we are. Denial turns down the heat of emotion, allowing a cooler approach to decision making and action. But doctors in denial concerning the moral worth of others can be convinced to carry out heinous operations for the "good" of science or the purity of their group, and military leaders in denial of an opponent's strength can lead their soldiers to annihilation. Individuals in denial can reject different aspects of reality in the service of reward, whether it is personal gain, avoiding pain, or enabling the infliction of pain on others.

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In a competitive world with limited resources, our desire system never rests. This is a good thing as it motivates us to take care of our self-interests and strive for bigger and better. But a desire system that never sleeps is a system that is motivated to accrue ever larger coffers or power. To satisfy this inflationary need is often not possible without harming others, either directly or indirectly. To offset the costs of harming another, desire recruits denial. This is a recipe for evil and the creation of excessive harms. It is a recipe that takes two, often benign and highly adaptive ingredients that are essential for motivating action and promoting survival, and combines them into an explosive outcome. Seen in this way, our capacity for evil is as great as our capacity for love and compassion. Evil is part of human nature, a capacity that can't be denied. What I will show is both how this capacity works, and how some of us, due to biological inheritance and environmental influence, are more likely to end up as evildoers.

Historical material on the lives of Franz Stangl and Adolf Eichmann, leaders in the Nazi annihilation of Jews, illustrates how desire and denial combine within individual minds to create excessive harms. Although this is a historical example, focused on the lives of only two men, stories like theirs have been recounted hundreds of times, all over the globe and across time. This pattern points to common mechanisms, identified in detail by the sciences of human nature.

Stangl was a politically motivated man with a burning desire to climb to the top of the Nazi hierarchy. A clear path opened when he was appointed commander of the Polish prison Treblinka. Unbeknownst to Stangl, Treblinka was one of the Nazi's concentration death camps. To fulfill his desire for power therefore required harming thousands of others, or more accurately, commanding Nazi soldiers to harm others on his behalf. But since Stangl had no burning desire to harm the Jews, he dehumanized them, transforming living, breathing, feeling, and thinking people into lifeless "cargo" — his own expression. Stangl was dry-eyed as officers under his command killed close to one million Jews, one third of them children. The reward? Power and status within the Nazi hierarchy. The death of innocent Jews was a foreseen consequence of Stangl's desire for power, not his direct goal.

Eichmann, Lieutenant Colonel in the Nazi regime, was considered one of the central architects of the Final Solution, the master plan for the extermination of Jews. Eichmann denied Jews their humanity by championing the pamphlets and posters that portrayed them as vermin and parasites. This dehumanizing transformation empowered Eichmann's belief that cleansing was the only solution to German integrity and power. Eichmann's reward? Elimination of the Jews. Unlike Stangl, killing Jews was rewarding. As the historian Yaacov Lozowick stated "Eichmann and his ilk did not come to murder Jews by accident or in a fit of absent-mindedness, nor by blindly obeying orders or by being small cogs in a big machine. They worked hard, thought hard, took the lead over many years. They were the alpinists of evil."

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Stangl and Eichmann: two different routes into evil. Both possible and both equally lethal to humanity.

This is a lean explanation of why evil evolved and how it develops within individuals and societies. It is an explanation that strips evil down to its root causes, focusing on the core psychological ingredients that enable us to violate moral norms and cause excessive harms to innocent others.

A difficult journey

This book takes you on a journey into evil. It is a story about our evolutionary past, our present state of affairs, and the prospects for our future. It is as much a story about you and me, as it is about all of our ancestors and future children. It is a story about the nature of moral decay and the prospects of moral growth. It is story about society's capacity to engineer great harm, and about our own individual responsibility to avoid joining in.

Explaining how our genes create brains that create a psychology of desire and denial that leads to excessive harms provides a satisfying explanation for the landscape of evil. It explains all varieties of evil by showing how particular genetic combinations can create moral monsters and how particular environmental conditions can convert good citizens into uncaring killers and extortionists. This explanation will not allow us to banish evil from the world. Rather, it will enable us to understand why some individuals acquire an addiction to feeling good by making others feel bad, and why others cause unimaginable harm to innocent victims while flying the flag of virtue. This, in turn, will help us gain greater awareness of our own vulnerabilities by monitoring the power of attraction between desire and denial.

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Endnotes: Prologue. Evilution

Recommended books:

There are numerous books about evil, most written by philosophers, theologians, historians, political scientists, and legal scholars. The following recommendations are for books about evil written by scientists. They are terrific, I have learned a great deal from them, and some of their ideas powerfully enrich the pages between these covers.

Baumeister, R. F. (1999). *Evil. Inside human violence and cruelty.* New York, W.H. Freeman.
Baron-Cohen, S. (2011). *The Science of Evil.* New York, Basic Books.
Oakley, B. (2007). *Mean Genes.* New York, Prometheus Books.
Staub, E. (2010). *Overcoming Evil.* New York, Oxford University Press.
Stone, M. H. (2009). *The Anatomy of Evil.* New York, Prometheus Books.
Zimbardo, P. (2007). *The Lucifer Effect.* New York, Random House.

Notes:

• For a philosophical account of the nature of goodness that treats evil as a deviation from our species' repertoire, see Philippa Foot *Natural Goodness* (2001, Oxford, Clarendon Press).

• For an explicit, philosophical argument for the connection between pleasure and evil, see Colin McGinn's *Ethics, Evil and Fiction* (1997, Oxford, Oxford University Press). For a comprehensive discussion of evil by a philosopher, including important critiques of the existing literature, see John Kekes' *The Roots of Evil* (2007, Ithaca, Cornell University Press)

• On killing throughout history: Wrangham, R.W. & Glowacki, L. (in press). Intergroup aggression in chimpanzees and war in nomadic hunter-gatherers: evaluating the chimpanzee model. *Human Nature*; Bowles, S. (2009). Did warfare among ancestral hunter-gatherers affect the evolution of human social behaviors? *Science, 324*, 1293-1298; Choi, J.-K., & Bowles, S. (2007). The coevolution of parochial altruism and war. *Science, 318*, 636-640; Grossman, D. (1995). *On killing: the psychological costs of learning to kill in war and society*. New York, NY: Little, Brown.

• For a summary of research on desire, especially the elements of wanting, liking and learning, see Berridge, K.C. (2009). Wanting and Liking: Observations from the Neuroscience and Psychology Laboratory. *Inquiry, 52*(4), 378-398; Kringelbach, M.L., & Berridge, K.C. (2009). Towards a functional neuroanatomy of pleasure and happiness. *Trends Cognitive Science 13*(1), 479-487.

• The most serious treatment of Stangl can be found in the penetrating interview by Gitta Sereny (1974, *Into that Darkness*: *From Mercy Killing to Mass Murder.* London: Random House). There have been different treatments of Adolf Eichmann, most famously by Hannah Arendt in her *Eichmann in Jerusalem: A report on the banality of evil.* (1963, New York, Viking Press). Arendt's perspective on Eichmann as an ordinary gentleman who simply followed orders has been seriously challenged, suggesting that he was anything but a banal evildoer; the quote by Holocaust scholar Yaacov Lozowick is one illustration of the more generally accepted view that Eichmann was a radical evildoer with heinous intentions to

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exterminate the Jews. He may have lived a calm and peaceful existence outside of his day job at Nazi headquarters, but this was no ordinary citizen.

Quotes:

• Quote by Lozowick on Eichmann and banality of evil: Lozowick, Y. (2002) *Hitler's Bureaucrats: The Nazi Security Police and the Banality of Evil.* New York, Continuum Press, p. 279.

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Chapter 1: Nature's secrets

Nature hides her secrets because of her essential loftiness, but not by means of ruse.
— ***Albert Einstein***

In Charles Darwin's day, biologists unearthed the mysteries of evolution by means of observation, sometimes accompanied by a simple experiment. This was largely a process of documenting the patterns of variation and uniformity that nature left behind. Only breeders were directly involved in manipulating these patterns, using artificial selection to alter the size, shape, coloration, and lifespan of plants and animals.

The Darwins of today continue this tradition, but with new tools, informed by understanding of the genetic code and aided by technical developments in engineering, physics, chemistry, and computer science. These tools allow for deeper penetration into the sources of change, and the causes of evolutionary similarities and differences. They also enable biologists to change the course of evolution and the patterns of development by turning genes off or turning novel ones on, and even creating synthetic organisms in test tubes — a wonderful playground for understanding both questions of origin, change, and extinction.

The Darwins of today are cowboys, trailblazing a new frontier of understanding. But like the frontier of the early American wild west, nature holds many secrets and surprises. Sometimes when we break through nature's guard, we gain fundamental truths about the living world, knowledge that can be harnessed to improve animal and human welfare. But sometimes when we break through, we create toxic consequences and ethical dilemmas. Tampering with nature is risky business as there are many hidden and unforeseen consequences.

In 1999, the molecular biologist Joe Tsien and his team at Princeton University tampered with mother nature. Their discovery, published in a distinguished scientific journal, soon filled the newspapers, radio airwaves, and even a spot on Dave Letterman's late night television show. Tsien manipulated a gene that was known to influence memory, causing it to work over time. This created a

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new line of mice with a special accessory: an upgraded memory and learning system. When these new and improved mice ran through an IQ test, they outperformed normal mice.

Tsien pulled off an extraordinary engineering trick, creating a lineage of smarter mice. This is cowboy science, showing the power of genetic tampering to open the door to evolutionary changes. In a world of competition, one would imagine that selection should favor these smart mice who have better recall of essential foraging routes, previous social interactions, and places to rest out of harm's way from predators. But in biology, there are always trade-offs. Benefits in one area of life are often accompanied by costs in others.

Several months after Tsien's report, a follow-up study of the same memory-enhanced mice appeared in print, also in a distinguished scientific journal. But this time there was no media fanfare. The new work was carried out by Min Zhuo at Washington University, an ex-member of Tsien's lab and a co-author of the original paper. Zhuo's new paper confirmed that memory-enhanced mice were indeed smarter, but also showed that they were more sensitive to pain, licking their wounds more and for longer periods of time than normal mice. Though it is unclear whether Zhuo's results reveal heightened pain sensitivity, stronger memories for pain, or some combination of these and other processes, what is clear is that the engineering that led to smarter mice led to much more.

Tsien and Zhuo's work shows that even with targeted, artificial changes in the underlying biology, unanticipated consequences are common. It also shows that deep within the biology of every organism lies hidden capacities and potential for change. Unleashing these *sub rosa* capacities can have both beneficial and costly consequences for the individual and group.

The idea I develop in this chapter is that our capacity for evil evolved as an incidental, but natural consequence of our uniquely engineered brain. Unlike any other species, our brain promiscuously combines and recombines thoughts and emotions to create a virtually limitless range of solutions to an ever-changing environment. This new form of intelligence enabled us to solve many problems, but two are of particular interest given their adaptive consequences: killing competitors and punishing cheaters in a diversity of contexts. But like the painful fall-out from *artificially* engineering a smarter mouse, so too was there fall-out from the *natural* engineering of a smarter human: a species that experiences pleasure from harming others. This is part of the recipe for evil.

This chapter sets out the evidence to support the idea that evil evolved as an incidental consequence of our brain's design. I begin by discussing the two general processes that landed us in the unforeseen and uninhabited niche of evildoers: the evolution of byproducts and promiscuous connections within the human brain. Because these are general processes, we will take a short reprieve from matters specifically evil.

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What's it for?

About 50 million years ago, a family of insects — the Phylliinae — evolved a distinctive piece of anatomy: a body that looks like a leaf. They also evolved the capacity for catalepsy or statuesque stillness. Their leafy body is so exquisitely designed that even predators with superb search images are fooled as they walk or fly by. But from the fact that the leafy body provides these insects with an invisibility cloak, and the fact that this enables them to escape predation, we cannot conclude that the leafy body evolved *for* predator evasion. What something is *used for today* may be different from what it *evolved for* — the difference between current utility and original function. To show that the leafy body evolved *for* predator evasion, we need to know more, which we do. For one, the leafy body is paired up with a requisite behavioral adaptation: turning to stone. If leaf insects fluttered about as actively as any other insect, their motion alone would cry out to the predators. Optimal effectiveness requires acting like a leaf. But acting like a leaf without the leafy body has its own independent benefits, paying off in terms of predator evasion, as well as sneaking up on potential mates. It would therefore make good sense if stillness evolved first followed by a leafy body. This is precisely what evolution's record reveals.

The adaptive advantage that comes from statuesque stillness and a leafy camouflage can only be measured against the backdrop of today's predator line-up. If some future-predator evolves more sophisticated abilities to discriminate real leaves from faux leaves, the Phylliinae will be out of luck. This new pressure from predators will, in turn, push for new evasive tricks, thus initiating the classic cycle of predator-prey evolution. What is adaptive for the Phylliinae today, may not be adaptive tomorrow.

The comparative study of the Phylliinae raises a class of questions posed by all evolutionary biologists, independently of their taxonomic biases or interests in physiology, morphology, or behavior: How did it originally evolve? What adaptive problem did it solve? Did it evolve to solve one adaptive problem, but over time shift to solve another — a case of what the late evolutionary biologist Stephen J. Gould referred to as an *exaptation*? Does the exaptation generate profits or losses for survival and reproduction? Is the trait associated with byproducts, incidental consequences of the evolutionary process? What effects, if any, do these byproducts have on survival and reproduction? These questions apply with equal force to evil as they do to language, music, mathematics, and religion. The fact that evil, relative to a leafy body, is more difficult to define, harder to measure, and impossible to experiment upon — at least ethically — doesn't mean we should take it off the table of scientific inquiry. What it means is that we must be clear about what we can understand, and how we can distinguish between the various interpretations on offer. When we explore the evolution of evil, what are we measuring and what evidence

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enables us to distinguish between adaptive and non-adaptive explanations? To answer this question, let us look at two illustrative examples that are more challenging than leafy coverage in insects: the evolution of tameness and religion.

Sheep, goats, cows, cats, and dogs are all domesticated animals, created by the forces of artificial selection. All have been transformed from a wild type to an animal that not only lives with us, but sometimes lives for us as food. All are more relaxed, less fearful, and less stressed in the presence of humans than their wild ancestors. Many of these animals seek human companionship. These are the trademark features of tameness. They are also consistently associated with other features that never entered into the breeder's calculations: floppier ears, curlier tails, more mottled fur, greater sensitivity to human communication, reduced response to predators, earlier sexual maturation, smaller brains, and higher levels of serotonin — a chemical messenger of the brain that regulates self-control. Some of these features appear directly relevant to tameness, whereas others appear entirely irrelevant. For example, serotonin is critically linked to self-control which is critically linked to an animal's ability to suppress aggression when threatened, which is critically linked to building a life with humans. Mottled fur is not critically linked to any of these benefits.

Domestication leads to a pastiche of characteristics, some indicative of the domesticator's goals and others orthogonal to it. How does the process of domestication, and artificial selection in particular, generate both desired and unanticipated traits?

In most cases of animal domestication, we know little about how the wild type changed because the only available information is either anecdotal or based on loose archaeological reconstructions. Consider the domestication of dogs from wolves, and especially the variability among dog breeds. Though it is clear that humans throughout history have bred dogs to serve particular functions, including herding, aggressive defense, and companionship, each of these personality styles is linked to other behavioral and physiological traits. For example, breeds with high activity levels are smaller than breeds with low activity levels, aggressive breeds have higher metabolic rates than docile breeds, and obedient breeds live longer than disobedient breeds. Does selection for aggressiveness cause an increase in metabolic rate or does selection for higher metabolic rate allow for heightened aggressiveness. Because these are all correlations, we don't know which trait pushed the other to change or whether both traits were favored at the same time.

There are two situations that provide a more clear-cut understanding of which feature was favored by selection and which emerged as an incidental byproduct: controlled experiments and domestication efforts that resulted in unambiguously undesirable traits. In the 1950s, the Russian biologist Dmitry Belyaev set out to domesticate the wild silver fox. Over several generations, he selectively bred those individuals who were most likely to allow a human experimenter to approach and hand them food. After

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45 years of selective breeding he got what he aimed for: a population of tame foxes, less fearful of humans and more interested in playing with them. But Belyaev also got much more than he aimed for: these tame foxes had floppier ears, curlier tails, smaller brains, higher serotonin levels, and much sharper social skills than their wild relatives. These tame foxes acquired the same package that virtually all other domesticated mammals had acquired: some desired and desirable traits and some surprises.

Belyaev's study shows that even under highly controlled laboratory conditions, artificial selection leaves a trail of unanticipated consequences, traits that come along for the ride. This link between desired and unanticipated features arises because the genes that create these features are like coupled oscillators: changes in the expression of one gene directly link to changes in the expression of others. At the level of the traits — the gene's expressions — some have no impact on survival or reproduction, while others may increase or decrease these aspects of fitness. We can illustrate this point by looking at an example from dog breeders.

Several hundred years ago, dog breeders used artificial selection to create snub-nosed breeds such as the pug, bull dog, and boxer. The idea was to satisfy our aesthetics for diminutive noses, and reduce the size of the dog's classically large protuberance. Over the course of several generations of picking the smallest-nosed members of the litter, pugs, bull dogs, and boxers emerged. But they also emerged with an unanticipated and maladaptive health problem: all of these breeds have a harder time breathing and staying cool than full-nosed or snouty dogs. No breeder would select for respiratory problems or an inability to stay cool. These traits emerged as costly byproducts of selection for a diminutive nose, and more abstractly, as a byproduct of our aesthetics. As in Tsien's experiments on memory enhanced mice, when we tamper with nature, we can cause great harm.

Research on the evolution of religion provides my second example of how to think about adaptations and byproducts. The different types of religion are like the different dog breeds: distinctive in many ways, but with a large number of shared traits in common. Most religions have a set of rules for group membership and expulsion, ritual practices, and beliefs in the supernatural. These commonalities suggest to some scholars that religion evolved to solve a particular problem, one that all humans confront. That problem is large scale cooperation among unrelated strangers, a topic I pick up in greater detail further on in this chapter. Other species cooperate, usually with a small number of individuals, mostly close kin. As the size of potential cooperators grows, and genetic relatedness among individuals within the group shrinks — adding more unfamiliar strangers to the mix — the potential risks of cooperating with a cheater increases. Religion, and its core features, evolved to diminish this risk and increase the odds of developing a society of stable cooperators. Viewed from this perspective, religion is an adaptation — in the *evolved for* sense.

For those scholars who favor the idea of religion as adaptation, supporting evidence comes from

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analyses of historical data together with experiments. Religious groups show higher levels of cooperation, often over longer periods of time, than many other organized, but non-religious groups. Religious groups also tend to last longer as groups than non-religious organizations or institutions. Cooperation among religious groups is often facilitated by punishment or the implication of punishment from a deity. In a study of 186 societies by the biologist Dominic Johnson, analyses showed that those who believed in a strong moralizing god, capable of doling out punishment, engaged in higher levels of cooperation, including paying taxes, complying with norms, and repaying loans. These observations are complimented by experiments showing that people are more generous about giving away their money in a bargaining game, and less likely to cheat, when they think about words associated with religion — *divine, God, spirit, sacred, prophet* — than when they think about neutral words. For example, in the dictator game, involving two anonymous players, one decides how much of a pot of money to give to the other. The recipient has no say, and is thus stuck with whatever the donor offers. In general, donors give either nothing or about half. When primed to think about religion, donors are more likely to give than keep the entire pot, and give more as well.

The implication of these results is that the religiously-minded feel that they are being watched. Cueing up words that are indicative of their religious beliefs, heightens their vigilance and their moral obligations. Religion fuels altruism and fends off the temptation to cheat.

All of the observations and experiments discussed above are fascinating and relevant to understanding the role of religion in past and present societies. But this evidence is irrelevant for understanding the evolutionary origins of religion. It is irrelevant because it can't determine whether religion originally evolved to solve the problem of large scale cooperation among strangers or whether it evolved for other reasons but was then used in the context of cooperation. This alternative explanation sees religion as an exaptation. No one doubts that religion provides social cohesion. No one doubts that religion also sends a buzzing reminder to the brain's moral conscience center. But from a description of what it does today, or even in the distant past, we can't conclude that it evolved for this purpose. That religious organizations show higher levels of cooperation than non-religious groups doesn't mean they evolved for cooperation. We also can't conclude that religion's effectiveness as social glue relies on uniquely religious psychological thoughts and emotions. Though the creation of and belief in supernatural powers may be unique to religion, other foundational beliefs and emotions are shared across different domains of knowledge: young children attribute intentions, beliefs and desires to unseen causes, including the movement of clouds and leaves; non-religious moral systems use punishment to embarrass, recruit regret, and fuel shame; like many religions, non-religious institutions also attempt to reprogram the thoughts and beliefs of its members — think of all the global rebel operatives that brainwash innocent children into becoming child soldiers. Religion helps itself to non-religious psychology. The utility of

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religion looks like a case of exaptation — an expression of human thoughts and emotions that originally evolved to solve problems other than cooperation, but once in place were swiftly adopted for solving problems of cooperation.

Further evidence in support of religion as exaptation comes from a follow-up to the dictator game experiment discussed above. If you swap religious words for non-religious but moral words such as *civic, duty, jury, court* and *police,* you get the same results: people give more money when thinking about these morally-pregnant, but non-religious words. It is also the case that if you paste up a photograph of eyes next to a money box for coffee, people give more than with a photograph of flowers. What these two studies show is that words and images that make us think about others, especially the possibility that others are watching, turns us into bigger spenders. These psychological transformations are not, however, specific to religion. Some may think that God is watching, but they and others may also think of a white-bearded, gavel-wielding, atheistic judge.

We learn three important lessons from the study of tameness and religion, lessons that will propel our discussion of evil. First, distinguish what something evolved for from what it is used for. Second, dissect complicated traits down into their component parts as the parts, together with their inter-dependence, may have different evolutionary histories. Third, the combination of independently evolved capacities can lead to novel adaptations and possibilities. Some combinations lead to altruistic and humane compassion toward those we don't know. Others lead to virulent hatred and annihilation of those we do know. The brain's promiscuity is a driving engine for both the good, the bad, and the ugly.

From the shackles of monogamy to the freedom of promiscuity

Many years ago, some American friends of mine were married in a small village in Tanzania. After the wedding, they went to a local official who was responsible for providing a marriage certificate. On the certificate were three choices, indicative of the type of marriage: Monogamous, Polygynous, and Potentially Polygynous. My friends chuckled, but aimed their pen with confidence at Monogamous. Before they could ink the certificate, however, several Tanzanian men shouted out "NO! At least Potentially Polygynous. Give yourself the option." Right, the option. The freedom to explore.

Among social animals, only a few species pair bond for life, or at least a very long time. This fact is equally true of the social mammals: less than 5% of the 4000 or so species are strictly monogamous. For these rare species, most of their efforts to think, plan, and feel are dedicated to their partner; what's left over goes into finding food and avoiding becoming dinner. Life is much more complicated for the rest of the social animals. Their social and sexual relationships are more promiscuous, less stable and less

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predictable. This unpredictability is partially responsible for changes in the brain. Promiscuous mating systems demand more flexibility, creativity and out of the box thinking.

The anthropologist Steve Gaulin explored the idea that a species' mating system is directly related to its capacity to think. Gaulin started by looking at two closely related species of voles, one monogamous and the other polygynous. In the polygynous vole, males typically mate with multiple females. To achieve this kind of mating success, males have large territories that encompass many smaller female territories. In the monogamous species, the male and female share the same territory, with mating restricted to the couple. These differences in mating system and space usage have two direct consequences: relative to the monogamous male vole, the polygynous male vole must travel much further in a day than the females and must recall where the female territories are located. For a polygynous male vole, mating success depends on long day trips, visiting each of the female territories. For the monogamous male vole, there are no physical or memory challenges as the female is virtually always nearby. Given the costs to a polygynous male vole of forgetting where the females live, there should be strong selection on the memory system. Gaulin confirmed this prediction by showing that polygynous male voles outcompete females of their species in a maze running competition, and also have larger memory systems than females. In the monogamous vole, there are no sex differences in maze running or memory.

Gaulin's work provides a gorgeous example of how evolutionary pressures can act on the brain to create differences in psychological capacity. Other examples abound, including evidence that fruit eaters have larger brains than leaf eaters, primates living in large social groups have larger frontal lobes than those living in smaller groups, and bats living in open habitats have smaller brains than those living in complex closed habitats. In each case, a particular ecological or social pressure — finding ripe fruit, updating the status of numerous social relationships, avoiding obstacles while in flight — sculpts differences in brain anatomy and function. Some of these pressures favor extreme specialization and myopia, whereas others favor a broader vision. Relative to every healthy member of our species, all other animals have tunnel vision. When our ancestors began to migrate out of Africa, the diversity of environments and social opportunities favored generalists with a broad and flexible vision.

To appreciate the significance of the human revolution in brain engineering, consider three cases of myopic, but highly adaptive intelligence in other animals, cases that lack the signature of intellectual promiscuity; these cases are of particular interest because they represent the kinds of examples that caused Darwin to doubt the beneficence of God, to reflect upon the cruelty of nature, and to ponder the problem of evil:

- The wasp *Ampulex compressa* tackles a specific species of cockroach, inserts a first stinger into its body to cause leg paralysis and eliminate fighting, then a second

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stinger into the brain that causes intense auto-grooming followed by three weeks of lethargy. During this down time, the cockroach turns into a living meal for the wasp's larvae.

•A Brazilian parasitoid wasp of the family *Braconidae*, lays its eggs inside a particular species of caterpillar, and once the larvae are fully developed, they hatch out of the caterpillar. Though it is strange enough for caterpillars to function like incubators, these innocent larvae were anything but innocent while developing inside the caterpillar. Once the larvae hatch, they are treated to an unprecedented level of care from the caterpillar who, Gandhi-like, foregoes all eating and moving to protect its adopted young, including violent head-swings against any intruder. The wasp has effectively brain-washed the caterpillar, hijacking its evolved instincts to care for its own young.

•A solitary wasp in the genus *Sceliphron* selectively feeds on the dangerous and much larger black widow spider, using two tricks: it secretes a substance that is like Teflon, allowing it to move into a spider's web without getting stuck; next, it flails around in the web to attract the spider, and once the spider is positioned above in kill mode, the wasp launches its stinger, piercing the spider right through the brain. End of black widow. If the wasp makes the slightest mistake, end of wasp.

The capacity that has evolved in these wasps is myopically focused on one problem, and one problem alone. Despite the mind control and deception that is part of their evolved competence, they don't deploy these skills in any other context. This highly adaptive and monogamous pattern of thinking runs throughout the animal kingdom and across different contexts, including male cleaner fish that attack female cleaner fish who violate the rules of mucus-eating from their clients, but do not deploy such draconian measures in other situations; birds that feign injury to deter predators from their nest, but deceive in no other context; cheetah mothers who demonstrate to their cubs how to bring down prey, but never provide pedagogical instructions in other relevant domains of development; and monkeys that understand how to use tools generously provided by humans but never create any of their own.

Like other animals, we too are equipped with adaptive capacities that evolved to solve particular problems. Unlike other animals, however, these same adaptive specializations are readily deployed to solve novel problems, often by combining capacities. Like wasps, we deceive, manipulate and parasitize others, often cruelly. But unlike wasps, we don't use these abilities with one type of victim in one context. As long as the opportunity for personal gain is high relative to the potential cost, we are more than willing to deceive, manipulate, and parasitize lovers, competitors and family members. When we attack rule violators, not only do we do so in the context of cheaters who eat but don't pay, but also deadbeat dads

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who fail to care for their young, cads who have extramarital affairs, and trigger-happy murderers who take the lives of innocent people. What changes in the brain enabled us, but no other species, to engage in promiscuous thinking?

To understand what changed in the brain, it is useful to paint a few broad-stroke comparisons, and then narrow in on the details. We know, for example, that brain size changed dramatically over the course of our evolutionary history, ultimately reaching three times the size of a chimpanzee's brain with the appearance of the first modern humans some 100-200,000 years ago. From the archaeological evidence, we can infer that some aspect of the internal workings of the brain — not simply size — must have changed at about the same time in order to explain the appearance of a new material culture of tools with multiple parts and functions, musical instruments, symbolically decorated burial grounds, and cave paintings. Before this period, the material culture of our ancestors was rather uncreative, with simple tools and no symbolism. The new material culture was heralded by a mind unlike any other animal. No other animal spontaneously creates symbols, though chimpanzees and bonobos can be trained to acquire those we invent and attempt to pass on. No other animal creates musical instruments or even uses their own voice for pure pleasure. No other animal buries its dead, no less memorializes them with decorations; ants drag dead members out of their colony area and deposit them in a heap, though this is driven by hygiene as opposed to ceremonial remembrance and respect. Only a species with the capacity to combine and recombine different evolved specializations of the brain could create these archaeological remains. This period in our evolutionary history marks the birth of our promiscuous brain. The brain sciences have helped us see the fine details of this new species of mind.

The comparative anatomists Ralph Holloway, James Rilling, and Kristina Aldridge have analyzed brain scans and skull casts of humans and all of the apes: chimpanzees, bonobos, gorillas, orangutans, and gibbons. This sample represents approximately 15 million years of evolution, and includes considerable diversity in mating systems, dietary preferences, use of tools, group size, life span, locomotion style, communication system, aggressiveness, and capacity for cooperation. Thus, gibbons are monogamously pair bonded, live in small family groups in the upper canopies, swinging and singing to defend their territories, never use or create tools, are omnivorous, restrict cooperation to within the family group, and show little aggression. Gorillas are folivores or leaf eaters, live in harem societies, knuckle walk on the ground, rarely use or make tools in the wild, show aggression primarily between harems, communicate with a diversity of sounds, and show limited cooperation even under captive conditions. Chimpanzees are promiscuous, omnivores who hunt for meat on the ground and in the tree tops, create a diversity of tools that are culturally distinctive between regions, communicate with a diversity of sounds, are lethal killers when they confront individuals from a neighboring community, and are cooperative especially in competitive situations. Despite this diversity, nonhuman ape brains are much

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more similar to each other than any one is to a human brain. What changed since we split off from our ape cousins is both the overall geometry of the brain in terms of the relative size of different components, as well as the connections both within and between these components. Some of the most spectacular changes evolved within the frontal and temporal lobes, as well as their connections to other areas of the brain involved in the control of emotion and stress. These circuits play a critical role in decision making, self control, short-term memory, social relationships, tool use and language.

For detail, and further evidence of the importance of connectivity in promiscuous thinking, we turn to brain imaging studies of healthy adults, developing children, and patient populations that lack the signature of promiscuity. Consider tool use. Though a wide variety of nonhuman animals use tools, only humans create tools that combine different materials, have multiple functioning parts, can be used for functions other than the one originally designed, and function in the context of survival, reproduction, and leisure. These properties are the signature of a promiscuous brain. When we look at the material culture of the most sophisticated animal tool user — the chimpanzee — we see tools that use a single material, have only a single functional part, are only designed for one function, and the function set is strictly limited to survival or reproduction. Something as simple as a pencil, beyond the chimpanzees' wildest imagination, consists of multiple materials (rubber, wood, lead, metal), was designed for writing but can be used for poking or keeping hair up in a bun, and has two functional parts (lead for writing, rubber for erasing). When you put a human subject in a brain scanner and record activity during observations of tool use, what you see is an orchestrated coordination between different and connected brain regions. There is activity in regions carrying out spatial analyses, motor behavior, goal directed assessments, and object recognition, and much of this activity is fed forward to the frontal areas for storage in working memory as well as judgment and evaluation. A healthy adult brain is a heavily connected brain. Promiscuity results from a network of interconnected brain regions.

Even resting brains show signs of promiscuity. When you lie down in bed and close your eyes, but before you drift off to sleep, your brain — assuming *you* are an adult and healthy — shows activity in a family of inter-connected brain regions called the *default network*. This is your brain at rest, but it is anything but at rest. Some of the most active areas involve those that are engaged when we evaluate social relationships, consider what others believe and desire, who they are, and how we might interact in the future. This same default network looks very different in children, as well as in the elderly: it is much less connected. Growing up is connecting up. Growing old is disconnecting. We gain promiscuous thinking as we mature and lose it as we age.

If connection is key, then disorders of the mind or physical insult should result in predictable loss of promiscuity. A brain imaging study of individuals with autism is revealing. Individuals with autism fall along a spectrum, from low to high functioning. Though this spectrum captures important

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differences, all inflicted with this developmental disorder have difficulty understanding the beliefs, intentions and emotions of others, and often become hyper-aroused when seeing, hearing, or touching rather unremarkable objects or events. All of these capacities require a system that can integrate multiple sources of information. During brain scanning, individuals with autism show a striking reduction in activity in an area called the insula and its connection to both the somatosensory cortex and amygdala. The insula is an area of the brain that is like a traffic cop, responsible for coordinating the flow of information in the brain, both where it is coming from and where it should go. The somatosensory cortex handles our body's response to the world, including its state of arousal. The amygdala plays a key role in emotional processing, and more generally, in generating positive or negative assessments about the value of an experience. With the traffic cop asleep, and the body's arousal and emotional hubs dormant, it is no wonder that those with autism lack empathy, can't understand what it means for someone to be in love, are befuddled by deception, and find the bombardment from our media-intense world truly overwhelming. The lack of connectivity among those with autism is proof that connectivity is necessary for promiscuous thinking.

Once we evolved our massively connected, promiscuous brain, tool use, communication, mathematics, music, and morality were transformed. No longer were we constrained to think within the confines of the evolved context. We could take aspects of an ancient psychology that evolved for one problem and use it for new purposes, some beneficial to us individually and as members of a group, and some costly to our own and others' survival.

Consider our capacity to defend members within a group against attack from individuals outside the group. Many, perhaps even the majority of religious groups have carried out this mission, some with violence such as the Catholic-Protestant conflict in Ireland, and some with tranquility such as the Tibetan's plea for peace amidst a powerful Chinese oppressor. The process starts, however, with an ancient system that we share with all socially living animals. To survive and reproduce, individuals cooperate with members of their own group and defend their resources against members of neighboring groups. All animals, humans included, recognize group members by distinctive markings or recalling features associated with specific individuals. We transformed this evolutionarily ancient capacity into a distinctively human one by combining it with our systems of language, morality, and beliefs. This combination allows us to use symbols to demarcate those within our group from those outside, to tie these symbols to distinctive beliefs, values, and emotions, and to use these different psychological systems to caricature the other as buffoon, vermin, parasite, or inanimate cargo. This combinatorial process allows us to cleanse the in-group by annihilating the out-group. It allows us to increase cooperation within a group while ramping up the defenses to take out enemies living outside the group. This strategy is simple and effective. First, convince one group of people that another group has a set of undesirable traits,

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features that will undermine the success of the in-group. This has the effect of tightening the bonds within the group. Next, convince the in-group that those undesirable qualities make the others less-than-human and barely nonhuman. Next, make sure that the nonhuman mascot for the out-group is vile, abhorrent, and disgusting. This ingredient is critical as it guarantees that each member of the in-group will feel a surge of disgust every time it sees or hears of the out-group. Once disgust is in motion, there is only one additional step: either destroy or purge the other of its vile qualities. Destruction is not only permissible, but morally obligatory, carried out guilt-free because the mind has taken the other out of the moral domain and into the domain of property — either dispensable, controllable or transformable. Taking out the other is rewarding. Harm feels good.

Our uniquely promiscuous minds invented dehumanization, using a recipe of adaptive ingredients — defense against an enemy, disgust as a response to noxious and unhealthy substances, and creative language use. This is a dangerous idea, one I develop in chapter 3. It is one of many capacities that enabled us to uniquely imagine new ways of inflicting excessive harm on others. It is a capacity that, nonetheless, has a deep evolutionary history.

HARMING OTHERS, version 1.0: non-lethal behavioral routines

All animals are motivated to secure resources that will enable them to survive and reproduce. At the most basic and universal level, this is what life is all about. Gaining access to resources enables individuals to accrue more resources, live longer, and produce more offspring. The path to acquiring resources is complicated by two facts of life that were central to Darwin's insights into the process of evolution: resources are limited and individuals must compete with others from the same and different species for these resources. Competition is the breeding ground for aggression — the most basic means of harming others. Aggression is a natural outcome of living in a social world where supper, sex, and space never come prepared on a silver platter. Here I explore the core properties of non-lethal aggression, a manner of harming others that is part of every animals' behavioral repertoire. This discussion sets the stage for understanding how evolution's R&D operation enabled a transformation of the non-lethal form of aggression into a lethal form, and ultimately, into an excessively lethal form that is the trademark of human evil. It also shows how the social norms guiding animal aggression evolved into moral norms, and thus, why we perceive some forms of aggression as deeply wrong, unethical and grotesque.

Consider life on Earth before human existence, say 10 million years ago. Our closest living relatives the chimpanzees and bonobos are living in the forests of Africa, and so too are dozens of other

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primates, mammals, birds, reptiles, amphibians, fish, and insects. And of course, there are animals populating every other continent and the seas that surround them. Among the social animals — those living in groups — the common form of aggression is one-on-one, and the context is typically competition over food, a place to rest, or access to a mate. Sometimes the aggression is initiated as an attack and sometimes it is in self-defense. Sometimes it is highly ritualized and planned, and sometimes it is a reactive free-for-all. Sometimes it occurs within the group and sometimes between. Severe injuries arise, but deaths are rare. The aim is to resolve a competitive dispute by means of non-lethal aggression, and if possible, non-physical contact. If someone dies it is because an injury leaves them incapacitated or vulnerable to disease. It is not because their opponent aimed to kill. The ubiquity of non-lethal aggression points to a suite of common biological ingredients, a core set of neurobiological, hormonal and psychological adaptations that constrain how animals fight.

It all starts with one individual perceiving a valuable resource that is within reaching distance of a competitor. What launches a first move and subsequently guides the process to its completion with a winner and a loser? In some species there are rules of thumb that deflate any aggressive instincts before they are launched, even though there are clear competitive interests. For example, in territorial lizards and birds, if an emigrating individual lands in an area and sees or hears another individual vigorously displaying — push-ups with colorfully flashing neck sacs in lizards, vocal arias in birds — they move on. The rule: territory owners win, no questions asked. Another rule of thumb arises in species organized around either permanent or breeding-only harems: one male and many females. Two classic cases are the well-studied hamadryas baboons of Ethiopia and the elephant seals of California. In both species, males are much larger than females, with elephant seals providing an extreme case — the harem *master* can be ten times bigger than the females he mates with. In hamadryas, no one challenges the male over access to the females in his harem. Competition arises in acquiring females into a harem, a process that starts early, with individual males recruiting juvenile females. In elephant seals, either one or a few males completely monopolize the mating among the often hundred or more females within the harem. These males rule. As evidenced by genetic fingerprinting, virtually all of the offspring are sired by 1-3 males. No mating competition. Competition arises when the young turks try to wear down the harem master through repeated challenges over the season. Eventually, often over the course of several mating seasons, the harem master loses a fight and hangs up his gloves.

Dominance hierarchies provide another set of rules or norms that guide competition, and thus aggression. In general, irrespective of the species, high ranking animals outcompete low ranking animals for access to resources. If the spread between two individuals within the hierarchy is large, the subordinate acts like a migrating lizard or bird landing in a resident's territory: no contest, no competition, no fighting. If the spread is less, say two individuals who hold adjacent positions within the hierarchy,

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then other factors enter into the calculation. This is where things get interesting as these *other factors* determine the start and end of a contest.

Insights into the dynamics of aggressive competition emerged in the late 1970s and early 1980s due to two fundamental developments within evolutionary biology. The first involved a marriage between economic game theory and evolutionary biology. This marriage was set up by the British evolutionary biologist John Maynard Smith who recognized that for any competitive interaction, there are different strategies, each with different payoffs. Some strategies are more costly, but return greater benefits. Others are more conservative and less costly, but return smaller benefits. How well any given strategy does depends on its frequency in the population, and thus, on whether the particular strategy is dominant or rare. For example, consider a baboon troop with 20 adult males. Imagine that one of the males decides to bare his canines, stand up on his two hind legs, and charge whenever anyone comes near him and he is eating. This male is displaying his intent to attack at the slightest provocation. One could imagine that this would be very effective, especially if he is the only one displaying in this way. But if this display pattern spreads, and all 19 other males do the same thing, then this strategy fails as it no longer distinguishes among the 20 males in the troop. What evolutionary game theory tells us is that the effectiveness of a strategy depends on how common it is within the population. Power comes, in part, from being not too common or predictable.

The second development involved signaling theory, and a challenge to the traditional approach that considered animal signals as truthful messengers of information. On the traditional view, when a monkey bares his canines, he is signaling his motivation to attack. When a dog puts his tail between his legs, he is signaling his submissive status. When a bird gives an alarm call, she is telling others that a predator is nearby. When a human smiles, he is conveying his desire for friendship. The new signaling theory presented a challenge to this honest view of communication. Why, for example, wouldn't individuals lie, deceiving others into believing that they were really tough, meek, in danger, or friendly, only to take advantage of the situation and gain added resources. Why, for example, wouldn't a baboon who was actually afraid, put on a tough-guy show and scare off his opponents? Why wouldn't a dog who was actually tough, send a submissive signal at the start of the interaction, cause his opponent to lower his guard, and then attack? Why wouldn't a bird send an alarm in the absence of danger, knowing that others will run for cover and leave all the food behind — no competition? Why wouldn't a human who actually wanted to lure in an innocent victim for robbery send a seductive smile? This line of questioning, developed by the British evolutionary biologists Richard Dawkins and John Krebs, led to a number of studies showing that animals are engaged in a much more complicated and dynamic dance when they compete. Static properties of the animal — its height, weight, tail length, antler size — indicate its raw, unfakeable ability to fight or what biologists call *Resource Holding Potential* or *RHP*. A deer with a large

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set of antlers has paid the costs of growth, and is thus, a serious opponent with considerable strength. A tall, heavy, long-tusked elephant bull has spent the time and energy to bulk up, and can throw this weight around in a fight. Added on to an animal's RHP are dynamic properties, features that require energetic investment in the moment such as the loudness or duration of a vocalization, or the height of a jump display. These dynamic properties form the foundation of competitive interactions, and the raw material for assessments. When a resource is up for grabs, and no simple rule of thumb or RHP factor trumps, animals assess each others' displays, working out whether to flee or escalate. What, if anything in a display, reflects the signaler's true capacity and motivation?

The Israeli evolutionary biologist Amotz Zahavi provided a simple, yet far-reaching explanation of honest signaling. Honesty, in the animal world, is simply about prediction. When a kob standing on his territorial mound charges toward another, to what extent does this display predict that he will continue the attack if the opponent doesn't flee? Is he all smoke or does the display accurately predict the follow-through? When a mantis shrimp uses his powerful claw to thump the sand at an intruder, will he go further, thumping the intruder who continues to advance? Zahavi's solution was based in economics: signals are honest if and only if they are costly to produce, where cost is relative to current condition or health. If every kob can charge even if they are blowing smoke, the charge display carries no weight. It is pure puffery and dishonest. If every mantis shrimp can thump with its appendage, and does so regardless of its current power, then sand thumping loses value. For a charging display or sand thumping to carry value, they have to be costly to produce and only those in good enough condition should be able to tolerate the costs. Numerous studies support Zahavi's insight, including work on insects, crabs, birds, and gazelles, as well as hunter-gatherers and religious institutions. Hunter-gatherers do it by showing off and sharing their large prey capture, whereas religions do it by showing their commitment to long and involved ritual displays.

The vast majority of animal competition is settled by means of non-lethal aggression. Animals adopt different strategies, use rules of thumb, and engage in assessment in order to minimize the costs of battle. This is version 1.0 of HARMING OTHERS. This version operates within every animal, humans included. Over time, some animals evolved hormonal and neural upgrades that changed how individuals experienced the thrill of victory and the agony of defeat, as well as changes in their willingness to take risks. These upgrades inched animals closer to lethal aggression, pushed some right into it, and others over the top.

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HARMING OTHERS, version 1.1: microcontrollers

In any competitive situation, whether it is animals working out a strategy for maximizing the odds of obtaining food or humans working out a strategy for maximizing the odds of check mating an opponent's king, someone will walk away as the winner and someone as the loser. Winning feels good and losing feels bad. Winning fuels confidence, losing lowers self-esteem. Depending on the opponent, including what they look like and whether they are familiar or unfamiliar, it is possible to gauge the likelihood of winning or losing in advance. Depending on the individual's prior history of wins and losses, and details of his or her personality, some individuals will embrace the challenge of a high risk-high payoff strategy whereas others will adopt a low-risk low payoff strategy. Winning, losing, and taking risks are all mediated by differences in hormone levels, neurochemicals, and patterns of brain activation. Some of these differences are set by the individual's biology, some change over the course of a year, some within a day, and some within the period of a brief glance that allows for an opponent to assess the competition. These physiological processes are the microcontrollers that regulate an individual's motivation to fight or flee, as well as the sense of reward and loss that accompanies winning and losing. These microcontrollers adaptively regulate the capacity to harm, at least until they malfunction. Malfunctions, whatever their cause, can convert healthy, defensive, competitive, and justifiable harms into over the top excessive and unethical harms.

One of the primary microcontrollers is the hormone testosterone. Though it is commonly assumed that testosterone is a male hormone, it is also present in females, though at lower concentrations. Testosterone plays an essential role in both sexual and aggressive behavior in all social animals. Testosterone surges when males defend their territories, and also, when they recruit sexually available females. Stronger surges occur when individuals are challenged by competitors who want their territory, food, mates, or position within a hierarchy. What this shows is that testosterone motivates animals within the arena of competition.

Testosterone also surges again after an individual wins a fight, and drops following a loss. This is highly adaptive as it motivates winners to keep defending their resources, and motivates losers to give up and minimize future costs. Across a wide variety of species, humans included, winners are two times more likely to win the next fight whereas losers are five times less likely to win the next fight. These winner-loser effects are mediated by testosterone. In our own species, among male and female athletes, in sports including soccer, tennis and judo, winners show higher testosterone levels than losers. This effect even holds in non-physical competition, such as chess and stock trading. In a study of day traders on the London Stock Exchange, those making the highest profits had the highest levels of testosterone. Even those who are simply witnesses to a winning competition show increases in testosterone, including

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cichlid fish spectators observing a winning fight, and soccer spectators seeing their team win the World Cup.

What many volumes of experiments reveal is that testosterone plays a fundamental role in social behavior across the animal kingdom, motivating individuals to defend their resources, acquire additional resources when possible, develop confidence following victory, and gracefully walk away following defeat. Testosterone influences behavior, and behavior influences testosterone. If an individual experiences a challenge, this causes an increase in testosterone. The increase in testosterone heightens confidence and risk-taking to defend the resources. Heightened confidence and risk-taking are often associated with winning fights. Winning fights increases testosterone, bringing us full circle to the challenges of social living.

Testosterone is joined by several other microcontrollers, including at least one additional hormone — cortisol — two neurochemicals — serotonin and dopamine — and several brain areas that are affected by these hormones and neurochemicals. Our understanding of this assemblage, beautifully synthesized by the psychologist Jack van Honk, accounts for both our adaptive and sometimes highly maladaptive capacity to harm others.

Cortisol mediates the stress response in fish, reptiles, birds, and mammals, including all ages of human mammals. When fear kicks in due to aggressive challenges from a dominant individual or from the appearance of a predator, cortisol rises. When individuals confront uncertainty, cortisol rises. When cortisol levels are high, individuals are more sensitive to punishment and more likely to avoid social interactions. Flipping the polarity around, when cortisol levels are low, individuals are more aggressive, more reward focused, and less sensitive to punishment. Testosterone and cortisol therefore play within the bodies of animals like two children sitting on opposite ends of a see-saw. When testosterone is up and cortisol is down, individuals are primed to harm others and take risks. When testosterone is down and cortisol is up, individuals are risk averse, less likely to harm and more likely to engage in friendly social behavior.

Serotonin, as noted earlier in the discussion of domestication, is primarily involved in self-control. High serotonin levels are associated with behavioral inhibition, whereas low serotonin levels are associated with disinhibition or impulsivity, as well as heightened aggression. Dopamine is linked to the experience of reward, both in terms of predicting when it will occur and in motivating behavior that maximizes the odds of obtaining the goods. When animals reach their goals or expect to obtain them, including food, mating, or winning a fight, the brain delivers a surge of dopamine. In humans, taking a drug that increases the amount of dopamine, causes people to believe that they will feel more elated about an event in the future.

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Testosterone modulates these brain chemicals, suppressing serotonin in the service of heightening aggression, and ramping up dopamine to add to the already reinforcing properties of testosterone. But like dopamine, testosterone is also directly linked to the reward system. Mice will work a response lever to deliver testosterone, and humans become addicted to it. If you inject testosterone into a mouse while it is moving about, the location associated with the injection becomes tagged as a favorite spot in the landscape, a place to revisit. Drug abusers and gamblers, two personality profiles associated with heightened experience of reward and poor self-control, have elevated levels of testosterone and dopamine.

Twirling inside the brains and bodies of all social animals is a physiological ballet that controls the capacity to harm others. This choreography links harming others with the experience of reward. In some animals, the link between harm and reward was upgraded to a capacity for lethal aggression.

HARMING OTHERS, version 1.5: upgrade to lethal aggression

All social animals have evolved the capacity for aggression, using it to fight members of their own species for food, land, and sex. For virtually all animals, winning a fight means chasing away or injuring a competitor, but not killing them. There are, however, three situations in which animals kill, two are broadly distributed across the animal kingdom and one is extremely rare. In virtually every taxonomic group of animals — insects, reptiles, amphibians, fish, birds, and mammals — there are predators and prey. Predators are not merely aggressive, but designed to kill prey species for the purpose of survival. Also common is infanticide, situations in which adults kill infants. Infanticide is often committed by males who have recently entered a group with infants sired by other males. By killing these infants, not only does the newcomer obliterate the competition's fitness, but he effectively reboots the female's sexual receptivity. Both predation and infanticide entail significant asymmetries in size or weaponry between attacker and victim, making the kill relatively cost-free. Rare in the animal kingdom are cases where attacker and victim are from the same species, both adults, and thus, comparable in size and weaponry. This kind of killing — call it *adulticide* — only occurs in a small number of species, but the attacks are sufficiently frequent to count as part of the repertoire: ants, lions, wolves, chimpanzees and humans. The rarity of adulticide raises important questions about the evolutionary pressures that favored this upgrade to harming others, as well as the mechanisms that evolved to make it possible.

Battles among ant colonies are notorious for their organized attacks, designed to kill the enemy and minimize costs. Watching ant colonies battle it out piques the imagination, recalling the classic face offs between British and French brigades, each side lined up in strategic formation, divided into ranks, set up to protect the land and royalty. In his book *Life in the Woods,* the American writer and nature lover Henry David Thoreau, writes that the ant battles were "deadly combat … without any noise… I never

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learned which party was victorious, nor the cause of the war: but I felt for the rest of that day as if I had had my feelings excited and harrowed by witnessing the struggle, the ferocity and carnage, of a human battle before my door." What is distinctive about ant battles and the deaths that ensue is that they are coordinated, with success driven by group size. As the biologist Eldridge Adams has demonstrated, bigger groups are more likely to win, more likely to kill a higher number of their smaller opponents, and less likely to incur any fatalities. Despite the similarities between ant and human battles, two differences undermine the usefulness of this analogy for understanding the evolution of lethal aggression in humans: ants are only a very distant evolutionary cousin, subject to extremely different pressures of social life, and their cooperative efforts are largely among individuals who are virtual genetic clones. When humans go to battle, cooperation is largely among unrelated individuals who are complete strangers. Of the small sample of species committing adulticide, chimpanzees are our best bet as they are closer evolutionary cousins and they join forces with kin and non-kin.

To get a sense of lethal aggression in chimpanzees, consider the following description by the anthropologist David Watts and his colleagues concerning an attack by males of the Ngogo community of Uganda (emphasized words are mine):

> [Field Assistant] G. Mbabazi found 12 adult and three adolescent males, 10 of which had participated in the boundary patrol 2 days before ... in the eastern part of the Ngogo chimpanzees' territory. They started another boundary patrol by quickly and ***quietly*** moving south and then east. At 0830 hr, they moved east through a field of elephant grass (Pennisetum purpureum), then reentered the forest and went toward the spot where BT, LO, and MO [three adult male chimpanzees] had been displaying 1 day before and the area where Ngogo males had patrolled the day before that. As they reentered the forest, the Ngogo chimpanzees met chimpanzees from another community. The neighboring chimpanzees were feeding quietly on Pseudospondias microcarpa fruit in the same tree under which BT, LO, and MO had displayed. G. Mbabazi could not ascertain the precise number of chimpanzees from the neighboring group, but he saw at least two females with infants, one juvenile, and one adult male that immediately fled northeast with the Ngogo chimpanzees ***in pursuit***. The Ngogo chimpanzees caught up to the strange adult male after chasing him for about 100 m and ***surrounded him***. Adult Ngogo male EL began to pummel the intruder, and adults BF, BRU, LO, and MO quickly joined him. The strange male tried to escape down a small hill but ***could not elude these five Ngogo males and others that joined them***. The Ngogo males, led by EL, continued to ***beat, bite, and kick him for 20 min,*** and dragged him farther down this hill into a small stream valley about 50 m away from the spot of his initial capture, where ***he died during or shortly after the attack***. All of the Ngogo males remained in the area after the stranger was killed. Several circled his body and some sniffed it, while others sat nearby. ...Careful inspection showed that the ***victim suffered wounds across his entire body*** ... including a deep gash to the bone on the left humerus and ***a deep puncture on the left side of the thorax near the heart***. The ***only missing body part was the victim's testes***, which were recovered 50 m away, near where he was initially captured (2006, p.g., 166).

Watts' description captures several important features of adulticide in chimpanzees — both at the same field site and others throughout Africa — and in other species. The lethal attacks are explicitly proactive and planned. This is important because many cases of non-lethal aggression are reactive and impulsive, and studies of human and nonhuman aggression reveal different brain mechanisms underlying these two forms of violence. When chimpanzees attack, they use stealth to sneak up on the victim, and

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then relentlessly hunt them down. When they catch the victim, the attack is brutal, focused on body parts that are necessary for moving, communicating and reproducing. The attackers commonly have a numerical advantage over the victims, a ratio of at least three to one. This power imbalance reduces the costs of the attack by making it almost impossible for the victim to retaliate. Proof of this cost-benefit analysis comes from the fact that the attacking party rarely incurs injuries, whereas the victims rarely escape alive. The benefit of these attacks is that the attacking community gains access to additional resources by weakening the competitive strength of their neighbors. In a well documented case from Jane Goodall's site in Gombe, Tanzania, one chimpanzee community literally eliminated their competitors in the neighboring community, absorbing the remaining individuals and land. Though such attacks are certainly not a daily affair, they occur with sufficient frequency and benefits to create a selective advantage for the winners.

The suite of behaviors that accompany coalitionary killing in chimpanzees has led several scientists, most notably Wrangham, to argue that this form of lethal aggression in chimpanzees is an adaptation, with deep parallels to human warfare. On this view, we inherited the upgrade to version 1.5 lethal aggression.

The claim that our capacity for killing, especially in war, is an evolved adaptation, is anathema to many, scholars in the humanities and social sciences. The visceral antagonism is triggered by the belief that biological explanations imply inevitability, and provide an excuse for the atrocities we create. For these scholars, war, and more generally, the high levels of killing observed among human populations, are recent, cultural concoctions, born out of human intelligence, the invention of projectile weapons, and high population density, to name a few. From this perspective, biology plays no meaningful role in our understanding of human violence. From this perspective, killing in chimpanzees looks nothing like killing in humans. This attitude echoes the famous 1986 Seville Statement on violence in which a group of distinguished scientists, including the ethologist Robert Hinde, the geneticist John Paul Scott, and the biological anthropologist Richard Leakey, sidelined biology with the following five statements:

1. "It is scientifically incorrect to say that we have inherited a tendency to make war from our animal ancestors."
2. "It is scientifically incorrect to say that war or any other violent behaviour is genetically programmed into our human nature."
3. "It is scientifically incorrect to say that in the course of human evolution there has been a selection for aggressive behaviour more than for other kinds of behaviour."
4. "It is scientifically incorrect to say that humans have a 'violent brain'."
5. "It is scientifically incorrect to say that war is caused by 'instinct' or any single motivation."

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These claims led to the rather dreamy-eyed utopian conclusion that "Just as 'wars begin in the minds of men', peace also begins in our minds. The same species who invented war is capable of inventing peace. The responsibility lies with each of us." In essence, understanding our biology will not contribute to understanding violence and war because we *invented* war as well as peace, woven out of nurture's cloth and her infinite tapestry of cultural potential. These kinds of claims about the role of biology in human behavior are at best incoherent, and at worst plain wrong. They are also dangerous because they imply a view of human nature that is infinitely plastic, unconstrained by both universal features of our biology, as well as individual differences that predispose some to extreme violence and others to extreme altruism.

What makes the Seville Statement, and other claims like it incoherent is a set of false attributions to biologists about the role of biology. Statements 2-5 are accurate in that it *is* incorrect to say that war or violence are *genetically programmed*, subject to stronger selection *than other kinds of behaviour*, built into the brain as a *violent brain*, and based on *instinct* with a single, inevitable output. But I don't know any biologists who believe statements like these. The biologist Peter Marler famously spoke of singing in birds as an *instinct to learn*, while the evolutionary psychologist Steven Pinker described the Chomskyan insight into language as the *language instinct*. A bird's instinct to learn does not mean that there is a one-to-one, inflexible mapping between genes or brain circuits and a specific type of song. All songbirds have the potential to acquire their species' song, and in some birds, such as mockingbirds and parrots, this capacity extends to acquiring the sounds of other animals and even inanimate sounds. But if there is no input at all, or if the bird is deafened, the output is deficient in structure, unrecognizable as a species-specific song. The same holds for the language instinct. Instincts are biological biases that constrain the range of potential variation. Biology differentiates songbirds from birds that don't learn their songs. This same biology allows some birds to learn one song and use it for life, and allows other birds to acquire a variety of different sounds for use in singing. The biology doesn't determine the specific content of a song. The content is determined by what the bird hears, constrained by what its bird brain and syrinx will process and reproduce. To a large extent, language is no different. Our biology allows us, but not any other species, to acquire language. This same biology sets up constraints, due in part to what our brains can keep in memory, what our ears can hear, and what our larynx can produce. Like songbirds, the specific content of what we say, whether with a French or Vietnamese accent, is determined by where we live and who we listen to.

If there is any intelligible sense of *genetically programmed* or *instinct*, whether for violence, language, sex, or mathematics, it is that our biology provides us with the capacity to acquire these domains of knowledge and expression. This doesn't mean that violence, language, sex or mathematics are inevitable or fixed in their expression. There are thousands of languages, ways of having sex, and forms

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of mathematical expression. There are also thousands of ways of being violent, and equally, ways of counteracting such violence. But none of this takes away from the importance of biology, especially its role in constraining the form that these expressions take in different environmental settings. To think otherwise is just wrong.

The debate about version 1.5 of lethal aggression gains interest if we restrict the conversation to the similarities and differences between chimpanzee and human killing. Similarities speak to our shared evolutionary history, including the mechanisms we inherited and the pressures that favored this form of violence. Differences speak to both changes in our biology and the environments we confronted and created.

Those who argue that the comparison between human and chimpanzee killing lacks any analytical value come from two different camps. On the one hand are anthropologists such as Robert Sussman and Brian Ferguson who suggest that chimpanzee killing is infrequent, has little benefit in terms of resources or competition, and is restricted to populations that are either artificially provisioned by humans or crowded in by us. They also suggest that the archaeological evidence for human warfare doesn't really begin until about 12,000 years ago. As Ferguson notes "To argue that war is a result of some sort of innate predisposition to wage it requires that war be practiced throughout our prehistoric past." This date, so Ferguson continues, is too recent to invoke natural selection as a cause, and leaves unexplained why there is no earlier evidence of massive killing if our last common ancestors had this capacity.

These criticisms either fly in the face of contradictory evidence or have little to do with the original ideas. Concerning chimpanzee killing, the evidence comes from multiple sites in East and West Africa, including sites with no provisioning and no crowding from humans. Further, analyses by Wrangham and his colleagues show that humans living as hunter-gatherers or subsistence farmers on the continents of Africa and South America, engage in coalitionary killing, using stealthy raids and imbalances of power to minimize the costs and maximize the benefits. Looking at 32 different small scale societies, calculations of the median death rate were between 164-595 per 100,000 per year. Looking at 9 chimpanzee communities spanning 5 populations in Tanzania, Uganda, and Ivory Coast, the rate was 69-287 per 100,000 per year. Chimpanzees fall well within the range of human hunter-gatherers and subsistence farmers. This evidence not only shows parallels between chimpanzees and human societies living under conditions most like our ancestors, but also provides a resounding rejection of the view that chimpanzee killing is infrequent and of trivial importance. If the rates of killing are comparable, then either they are trivial for both species or trivial for neither. Given that both chimpanzees and human hunter-gatherers live in small groups, killing even a few individuals can have a dramatic effect on their capacity to defend resources.

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A further parallel between chimpanzees and small scale human societies comes from analyses of two extreme warring societies, the Waorani of New Zealand and the Yanomamo of Venezuela. Though violence accounts for between 40-55% of all deaths in these two groups, attackers appeared immune to injury, with no more than 5% dying in battle, and often no deaths at all. Chimpanzee attackers are likewise immune to injury, due in large part to the strategic use of imbalances of power.

The parallels between chimpanzees and humans living in small scale societies supports the idea that similar pressures favored the capacity for coalitionary killing in both species. Does this mean that each of these species should always kill in this way, and thus, as argued by Ferguson, the archaeological record should be chock full of deaths by coalitionary attackers? To argue for this position is to misunderstand the nature of an adaptation, and the arguments put forth by Wrangham as well as the evolutionary psychologists Martin Daly, Margo Wilson, and David Buss. As I discussed earlier on in this chapter, adaptations are contingent upon particular environmental circumstances. What is adaptive today need not be tomorrow. This is why it is not only unsurprising to see variation in the frequency of coalitionary killing among chimpanzee sites, among humans living in small scale societies, and among modern day humans who sometimes kill their spouses, stepchildren, and rivals, but predicted by evolutionary theory. Adaptations are economically efficient solutions to particular social or ecological problems. If those problems or pressures change, the original adaptation may have no impact on survival or a negative impact. A hiatus in the archaeological record — assuming this is the last word — is interesting with respect to the conditions that might favor or select against coalitionary killing, but in no way undermines the logic of an evolutionary adaptation, one shared by chimpanzees and humans.

The second camp arguing against the parallels between humans and chimpanzees is defended by the economist Samuel Bowles and his colleagues. Unlike the anthropologists, Bowles is entirely sympathetic to biology but sees fundamental differences in the pattern of human killing and warfare. To explain these differences he invokes two important attributes of human societies that have only weak parallels in other species: large scale cooperation with unrelated others from the same group, together with hatred, symbolic labeling, and the motivation to hurt all others outside the group. These two factors, what Bowles calls *parochial altruism*, may have paradoxically generated both greater levels of cooperation within groups and higher rates of warfare between groups. Those groups with the best cooperators acquired the greatest resources and experienced the fewest losses due to cheaters and other morally corrosive rogues. This power and inward-looking favoritism led to self-defensive emotions and behaviors, ultimately leading to lethal aggression toward those with different beliefs and values. Thus parochialism and altruism co-evolved, hand in hand, breeding prejudice as a result of group safety. This evolutionary handshake resulted in warfare and our unique capacity as killers.

Bowles' analysis is interesting and consistent with my explanation of how we evolved the

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capacity for evil. For both Bowles and I, certain aspects of our capacity to harm others emerges as an incidental byproduct of other capacities, and once this dynamic emerges, the combination of these capacities can evolve and change. What Bowles' analysis misses, however, is the fact that parochial altruism could well be true, and so too could our shared capacity for killing with chimpanzees. As noted above, rates of killing among chimpanzees and several small scale societies are comparable, and so too are the costs and benefits to attackers and victims. This argues in favor of a shared history, and a shared adaptation. It does not mean that all aspects of killing in humans are similar, or that the human mind froze in a chimpanzee state with regard to its capacity to kill. It most definitely did not freeze.

Unlike the lethal attacks by chimpanzees that are restricted to cases where groups attack lone victims, primarily from neighboring groups, we wreak havoc on a massive scale, with one on one, many against many, and one against many, including victims within and outside our core group. Unlike chimpanzees, even our young children have an appetite for violence that can be nurtured, as evidenced by the brutality of child soldiers around the globe. Unlike chimpanzees, individuals will sacrifice themselves for an entire group as evidenced most recently by suicide bombers in the Middle East. Unlike chimpanzees, we derive great pleasure from watching others suffer, from watching violent movies, seeing other animals fight, and imagining the decimation of an enemy. Our minds also generate ideological reasons to motivate violence at extraordinary scales — again, think of suicide bombers taking their lives for a God, as well as the reward of an idyllic afterlife. And when our minds break down, or when we are afflicted with particular disorders early in life, we are capable of experiencing bizarre appetites for violence, including the joy of eating the flesh of murdered victims, having intercourse with dead bodies, and asking for bondage and whippings to enhance sexual pleasure. These novel and unanticipated ways of harming others are the result of new hardware that has evolved only once in the history of this planet.

HARMING OTHERS, version 2.0: requires Homo sapiens hardware

We depart from the pattern of adulticide seen in other animals because of our promiscuous brain. The idea is not that our brains evolved for killing in these unique ways, but rather, that our unique style of thinking led to novel ways of harming as an incidental consequence. The hardware that is our brain enabled new ways of harming others, building on specialized adaptations, some shared with other species and some uniquely human. The result is a brain that can develop a peculiar appetite for harming others.

To see how version 2.0 runs on our distinctively human hardware, let's return to some of the core microcontrollers that I discussed a few sections back. Recall that there are hormones like testosterone that surge when individuals win a competition, whether this involves the physical fighting of deer using

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their antlers, humans using their fists, or chess masters using their minds. Along with testosterone's increase is an increase in dopamine, a decrease in cortisol and serotonin, and a decrease in frontal lobe activity and control. Within the environment of a promiscuous brain, this physiological ballet affects our sense of fairness, empathy, moral conscience, attitude toward retribution and justice, as well our willingness to engage in lethal aggression.

Brain imaging studies reveal that the prefrontal cortex plays an essential role in regulating our aggressive instincts, when it's working. When individuals respond aggressively to an unfair offer in a bargaining game, testosterone levels rise and activity decreases in a part of the prefrontal cortex associated with self-control. Thus, testosterone's effectiveness in human aggression is facilitated by a loss of control. Damage within this region of the brain causes abnormal aggressive responses to not only direct insult, but even such trivial matters as being offered a lowish offer in the ultimatum game discussed earlier. Anatomical and functional abnormalities within this region of the frontal lobes are also associated with aggressive pathology, such as psychopathology. There are also individual differences in aggressive tendencies among healthy people, due in part to differences in the patterns of activity between the right and left prefrontal cortices. Heightened activity on the left is associated with greater sensitivity to reward, lowered sensitivity to punishment, and considerably stronger aggressive responses to threatening stimuli, such as an angry face. This is not simply a correlation, as evidenced by studies that experimentally either suppress or increase activity in one hemisphere compared with the other. For example, if you contract your right hand you will increase activity in the left hemisphere of the brain; conversely, contracting the left hand increases activity in the right hemisphere. Subjects contracting the right hand in an experimental setting showed more aggressive responses to insult than did subjects contracting the left hand. The next time someone shakes a fist at you, check whether it is the right or left hand. If the person is from a different group and holds a fundamentally different suite of ideological beliefs, which hand is clenched is the least of your worries.

Favoritism toward those who are like us, combined with hatred toward those who are not, is common in animals. As noted above, in-group favoritism or parochialism can lead to heightened levels of cooperation within groups, while simultaneously increasing the level of hostility towards those outside. Our promiscuous brain facilitated this co-evolutionary process, inviting the hormone oxytocin into the mix. Among mammals, including humans, oxytocin is released in females during labor and breastfeeding, and in both males and females during social bonding and parenting. This has led many to think of oxytocin as the cuddle hormone or love drug. Floating within the human brain, oxytocin boosts trust in games of cooperation, and greatly increases our ethnocentric biases. The Dutch psychologist Carsten De Dreu and his colleagues ran a series of experiments that required male subjects to spray oxytocin or a control up their noses. When oxytocin shoots up the nose, it goes straight to the brain. Relative to the

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control group, those who sniffed oxytocin perceived in-group members as more likeable, more human, more richly endowed with social emotions such as embarrassment, contempt, humiliation and admiration, and more worthy of saving in an emergency. Oxytocin increases our sense of camaraderie toward those within the inner sanctum, which can result in greater animosity toward those outside. Oxytocin may therefore facilitate our ability to take out the competition even if this means killing another human being. Oxytocin is two-faced, cuddling with its left profile and harming with its right.

This is a small sampling of the ways in which our promiscuous brain enables new forms of harm, including killing other adults. We didn't invent lethal aggression. We share this capacity with a small group of animals that also kill other adults. But whereas these other species typically restrict their lethal attacks to situations in which one group greatly outnumbers another, typically targeting adults from a neighboring group, we evolved far beyond this monogamous approach. We adopted the cost-benefit analysis that drives killing in other animals and applied it to killing in a virtually limitless space of homicidal opportunities. We kill when we outnumber our opponents or are outnumbered by them, attacking individuals within and outside our core group. We kill spouses, ex-lovers, stepchildren, those who believe in God and those who don't, the wealthy and the poor, kin and non-kin, and even ourselves if the cause is good enough. Virtually anything goes.

Our promiscuous brains opened a Pandora's box of harmful means, including the capacity to address a multitude of injustices. This is a capacity that is inherently good, but incidentally bad. It is a capacity that evolved in response to growing pressures to balance inequities and take care of those who attempt to cheat society. It is a capacity that enabled us to engage in punishment in a broad range of contexts, righting wrongs and opening a new path to feeling good about harming others.

Incidental justice

Cooperation is ubiquitous in the animal kingdom, occurring in a wide range of situations. Humans are no exception. Like ants, humans also bring resources to their queen — think England. Like scrub jays, humans work with extended family members to rear the next generation of offspring — think Mormons. Like dolphins, human males form super-coalitions to gain access to females — think the Yanomami Indians of South America, where men raid neighboring villages to take their women. And like chimpanzees, humans cooperate to monitor their borders, often capturing and killing intruders — think Palestine and Israel. But human cooperation is distinctive in two ways: we frequently cooperate with

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large numbers of genetically unrelated strangers, and punish those who cheat by free-riding on others' good will.

The challenge to any cooperative enterprise is to avoid getting suckered by free-riders who cheat and add little or no help. As group size grows, the opportunity to cheat and get away with it grows as well given the challenges of storing information about reputation. How do individuals and groups avoid this sucker problem?

When nonhuman animals cooperate with members of the same species, they typically target kin. Helping kin provides a buffer against the sucker's costs because investing in kin means investing in genetic posterity. Helping relatives, even at a cost, translates to helping ones genes move on into the next generation — an insight developed by the British evolutionary biologist William D. Hamilton. When cooperation involves unrelated others, nonhuman animals attempt to circumvent the sucker's problem by working with a small number of familiar others whose reputation is known, targeting contexts where all participants benefit more from working cooperatively than working alone. These mutual benefits help offset the costs of cooperation.

By restricting cooperation to relatives or small numbers of unrelated but familiar group members, animal societies have buffered themselves from extreme cheating. This is significant because cheaters arise in a variety of contexts where there are rules of engagement, including both cooperative and non-cooperative situations. For example, both lions and chimpanzees cooperate in group defense against dangerous neighbors. Some individuals cheat by lagging behind, or failing to join in altogether. In societies organized around hierarchies, low ranking animals sometimes cheat by attempting to eat more than their fare share or by reproducing when their societal norms explicitly forbid it. Interestingly, cheaters in cooperative situations such as those in lions and chimpanzees, never suffer any adverse consequences from the dominants. In contrast, cheaters in competitive situations such as those that arise in hierarchical societies, are punished. Nonhuman animals thus have the capacity to recognize and change rule breakers. And yet, these capacities are not applied in the context of cooperative interactions. Monogamous thinking rules.

When it comes to enforcing fairness in cooperation, the fundamental barrier for animals lies with the economics of punishment. Punishment is costly. When a cheater is detected and attacked, there is always the possibility that he will retaliate. Cheaters, even when caught, need not surrender without a fight. Punishment therefore requires the capacity to surmount an immediate cost, while recognizing the possibility that any benefit could be greatly delayed. For example, lashing out against a lion laggard or a chimpanzee cheater might cause each to join in on future cooperative ventures, but this is a delayed benefit, and it may never materialize. This adds another potential opportunity cost. As Shakespeare so deftly noted "Defer no time, delays have dangerous ends."

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Waiting for a future benefit, whatever its currency, is hard for all animals, humans included. Studies of rats, birds, monkeys, apes, human children and adults show that individuals perceive future gains as less valuable than immediate, but smaller gains. For example, give any one of these animals a choice between one piece of food and ten, and they will pick the ten. More is better than less, except if you are a dieting human. Now give them a choice between one piece available immediately and ten pieces available after some delay. Virtually every animal shifts to the one piece, with the only comparative difference linked to the length of the delay — a few seconds for rats, birds, most monkeys, young children, and adults with frontal lobe damage, a few minutes for some apes, older children and some adults. Everyone is, to some extent, pulled by the hedonistic now. The future loses its luster when a tasty alternative is just within reach. This is in part due to the uncertainty associated with the future, and in part, the sheer temptation to take what is in front of us.

Unique evolutionary changes in the human brain allowed us to exert much greater patience, overriding the pull of the hedonistic now. These changes didn't evolve *for* punishment, but they were readily deployed by this system of justice. We rely on creative strategies to place value on the future, including putting resources away so that we can't use them — think savings accounts — and making verbal commitments that bind us to the future — think about the social embarrassment of failing in front of friends. These strategies help diminish the emotional pull of taking what is immediately available, allowing future benefits to gain in attractiveness. This is a brain that can wait for the delayed benefits of punishment.

The brain changes that facilitated our capacity to delay gratification were accompanied by others that further offset the costs of punishment: our brains reward us with a feel-good feeling when we pay the costs of punishment. For the first time in evolutionary history, the physical and psychological costs of punishment were at least partially offset by the pleasure of justice served, whether delivered directly or witnessed from afar.

When we punish or get even with those who have acted badly, we feel a hedonic high, an experience captured by the metaphor "revenge is sweet but not fattening." As demonstrated by the economist Ernst Fehr, this is more than a metaphor. When we hand someone his just deserts, punishing someone for cheating, lying, or breaking a promise, our brain responds as if we handed ourselves just desserts, activating brain circuitry associated with reward. In one study, two subjects played a monetary exchange game in which one player — the donor — decided how much of a pot of money to give to another. A third player observed, out of view, the outcome of the exchange. In some cases, observers witnessed a fair division of the money and in other cases, an unfair division in which the donor kept a disproportionate amount of the total. The observer then faced a difficult decision: leave the two players with their take-home earnings or use personal funds to take away money from the donor, returning it to

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the bank. Taking money away from the donor is a form of costly punishment. It is costly in two ways: the punisher loses money he could have kept, and the donor loses money that he unfairly kept in his previous exchange.

When donors kept a significantly larger portion of the original sum, observers punished, paying the costs. They also reported feeling good about taking down the cheapskates. Where was this honey hit to the brain coming from?

To figure this out, Fehr and his colleagues put people in a brain scanner and used a technique called Positron Emission Tomography or PET. This type of scanning provides a picture of how much glucose is used up by different brain areas during a task. Higher glucose consumption occurs when there is higher activity in a brain region. When punishers decided to punish a selfish donor, glucose consumption increased in a region of the brain associated with reward: the dorsal striatum. This region is also active when you eat ice cream, earn money, and solve an unexpected problem. Punishers incurred a financial cost, but gained emotional elation and internal reward. It turns out that giving someone his just deserts feels like eating dessert, but without the caloric gain.

When distinctively promiscuous punishment evolved, it transformed our capacity to cooperate and to maintain conformity to social norms. It provided us with the tools to not only repair a puncture in the system of norms, but to feel good about the costs personally incurred. When we punish, we have served justice and served ourselves a helping of the brain's rewards. The fossil record doesn't capture when we evolved the capacity to punish, as skulls and bones, stone tools, and even paintings are silent on why someone received a spear through the head — perhaps punished for a wrong doing or perhaps an enemy, a competitor interested in the same resources, or a suspected lover. No one will ever know. What we do know is that other primates never punish cheaters who break the norms of cooperation, whereas hunter-gatherers dotting the continents do. Though people living today as hunter-gatherers are not perfect replicas of what life was like way back when, they indicate that before we had sophisticated technology, agriculture, and permanent residences, we had the capacity to minimize the costs of the sucker's problem. Whenever this capacity emerged in human evolution, it provided a critical part of the solution to the problem of large-scale cooperation among unrelated strangers. With many eyes on the look out for cheaters, and a capacity to take out or ostracize the free riders, cooperation emerged as a stable solution to problems that are unsolvable at an individual level, including group defense and the acquisition of costly resources. Punishment enabled humans to live in large, stable cooperative societies, many of whom are unrelated strangers.

This momentous event in the history of cooperation carried with it a serious cost, bringing aggression and reward into closer proximity, with the costs of attacking others overshadowed by the benefits. As I discuss in greater detail in the next chapter, this economic transformation created, as an

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incidental consequence, a hunger to watch violence and to see it as entertainment. It allowed our feelings of inequity and envy to morph into schadenfreude, retaliation, and spite. It allowed us to enjoy violence as perpetrators and spectators. It allowed us to put our money on feeling good about righting an injustice.

Why oh why?

Why did evil, expressed as excessive harm to innocent others, evolve? The answer lies, so I suggest, in a special property of the human brain. Some time after we diverged from a chimpanzee-like common ancestor, the human brain was remodeled to allow promiscuous connections between previously unconnected circuits. Promiscuity enabled us to explore new problems using a combination of older, but nonetheless adaptive parts. Some of these novel explorations led to highly adaptive consequences, as when we developed the ability to self-deceive in the service of pumping ourselves up to do better in the context of competition; or when we invented new technologies to solve difficult environmental problems, such as using spears to capture prey at a distance; or, when we acquired the know-how to stockpile and enhance resources such as food, water and fertile land that are critical to individual survival and reproduction; or when we evolved the richly textured social emotions of jealousy, shame, guilt, elation, and empathy, feelings that motivate individuals to recognize the importance of others' well-being and interests and to correct prior wrongs; or, when we tapped into the rich connection between reward and aggression to punish cheaters trying to destabilize a cooperative society. But these same adaptive explorations also resulted in incidental costs that have destroyed the lives of innocent individuals. The capacity to deny others' moral worth enabled us to justify great harms, including self-sacrifice as living bombs designed to annihilate thousands of non-believers. The capacity to create advanced weaponry enabled us to kill at a distance, thereby avoiding the aversiveness of taking out those staring back. The capacity to stockpile resources led to the growth of greed, increasing disparities among members of society, the inspiration to steal, and heightened violence both to defend and to obtain. The capacity to experience social emotions such as jealousy led to blind rage and a driving engine of homicide, including cuckolded lovers who kill their spouses and stepparents who kill their stepchildren. The capacity to feel good about harming others enabled us to recruit this elixir in the service of causing excessive harm in any number of novel contexts, from ethnic cleansings to bizarre fetishes that include self-mutilation. And the list goes on. This is the yin and yang of promiscuous thinking. This is the natural history of evil, its ancestry and adaptive significance. This evolutionary explanation sets the stage for unpacking the recipe for evil, how it develops within individuals and societies, ingredient by ingredient.

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Endnotes: Chapter 1

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Chapter 2: Runaway desire

> The desire of being believed, or the desire of persuading, of leading and directing other people, seems to be one of the strongest of all of our desires.
>
> — ***Adam Smith***

In 1999, an investment officer in a management firm had a gut feeling that something was wrong in a corner of the securities market. Based on calculations from the stated investment strategy for the fund, the returns were not only orbiting outside the financial stratosphere, but were mathematically impossible. The officer contacted the Securities and Exchange Commission, outlined the problem, and asked them to look into it. No reply. Year after year, the officer continued to contact the SEC about this case, explaining that it was potentially lethal, that he had no personal investments in the fund, and had never been an employee. No reply. Then, in 2007, he sent the SEC a 17-page report, showing why there was only one plausible conclusion: the stated strategy for the fund was a fraudulent cover up for a massive money-making scheme. Eventually, in 2008, the brains behind this scheme was ousted, escorted to a life in prison as number 61727-054, and welcomed to his new home by a community of like-minded white-collar criminals.

Meet HARRY MARKOPOLOS — the investment officer — MADOFF SECURITIES — the seductive investment opportunity — and BERNARD MADOFF — the genius behind one of the most spectacular Ponzi schemes in recorded history. Whistleblowers started warning the SEC as early as 1992, but no one listened. Madoff was making money hand over fist by pocketing new investments and if needed, using some of these to pay off individuals wishing to redeem their funds. Ponzi schemes work as long as new investments exceed the number of investors wishing to redeem their own investments. And for Madoff, this balancing act worked for 16 years. Then, as in the Bible's Book of Joshua, the walls came tumbling down, with Jericho riding in to hand Madoff a 150-year prison term for the financial murder of his trusting clients. Altogether, these innocent and trusting people lost approximately $65 billion dollars, all because one man allowed his desire for wealth and power to run out of control. Or so it seemed.

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Were those who put their money in Madoff securities entirely innocent? Or, like Madoff, did they too allow their desire for more wealth to run wild? Was Madoff's desire for extreme wealth that far off the curve of human variation? And if he was off, who or what do we blame? Could some quirky feature of Madoff's genome, together with the brain states it orchestrates, have pushed him over the edge into a universe of unreasonable and even irrational desires? Does it matter that Madoff grew up in a world in which the rich get richer despite the direct or indirect harm caused to innocent others?

Many have speculated answers to these questions, based on little or no evidence, and certainly no scientific evidence. But what matters most about case studies such as this is that they raise the kinds of questions that science can answer. What matters is that it is possible to run a Ponzi scheme. It is possible because there are humans like Madoff who are driven by the desire to accumulate great wealth, despite the personal risks and costs to others. It is possible because the world is populated by people who are willing to throw critical reasoning to the wind in the face of a tempting offer to make a huge amount of money. It is possible because people will take risks either without considering the potentially horrific consequences to innocent others, or by trivializing them.

As far as we know, Madoff never intended to put his friends and family members in a state of financial ruin. As far as we know, many invested in his securities knowing that investments can fail. As far as we know, some must have been suspicious, at least for a while, about how their investments could consistently yield such over the top returns when nothing else has or seemingly could. Madoff is certainly to blame for creating a fraudulent investment opportunity, but so too are the many who trusted him without question, happy to make absurdly high returns.

Did Madoff cause excessive harm? Yes. Were those harmed innocent victims? Not entirely. None were forced to invest, and all invested with at least some knowledge that the promised returns were off the charts. This is not innocence. This is desire run amuck while self-control and reason fly standby. Madoff was morally wrong, but not evil, at least not on my accounting of the ingredients of evil.

Madoff's case illustrates the power of desire to stampede reason. As the essayist James Thurber remarked, "Love is blind, but desire just doesn't give a good goddamn." Madoff didn't give a good goddamn. How does a system like this get going, and then sometimes go wrong, very wrong? It all starts with the elements of pleasure.

P for pleasure

Imagine that scientists have just announced the discovery of a center in the brain that manages our experience of pleasure. Imagine further that they have invented a consumer device that, for only $49.99,

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enables you to ramp up or down the activity in the pleasure center. Want to get a bit more out of your dinner, a movie, tennis stroke, work, or sex? Flip the switch. Want to buffer yourself from the pain of ostracism, a romantic break up, or a colonoscopy? Flip the switch. Would you buy it? If so, what would you use it for, and would you be a habitual user? Would you worry about any side effects? Might using this device become addictive, or worse, either destroy the feeling of pleasure altogether or push you into a never-ending quest for satisfaction, with each dollop of pleasure leaving you wanting a bigger dollop next time around. This may seem like science fiction, but it's closer to non-fiction.

Over fifty years ago, scientists working with rats, implanted electrodes into in a region of the brain called the nucleus accumbens. The electrodes were connected to a switch. If the rat pressed the switch, it activated the electrode and thus stimulated this brain area. The rats indeed pressed, over and over again, some at a rate of 2000 presses per hour, with no external reward or threat of punishment. Pressing the switch was the reward, or at least the vehicle to what appeared to be the experience of reward. Pressing the switch was addictive. These scientists had discovered a critical part of the circuitry of pleasure, in rats! The rats discovered a pleasure switch, something they wanted to experience over and over and over again.

Soon after this discovery, clinicians started using deep brain stimulation to treat individuals with neurological complications, including Parkinson's patients suffering from loss of motor control, patients experiencing sustained pain, Tourette's patients suffering from motor tics and obsessive-compulsive problems, and even a patient in a coma who had lost, but then slowly recovered the capacity to name and grasp objects. Similar to the rat work, the technique involves implanting an electrical pulse generator within a targeted brain region. When the generator is turned on, it stimulates activity in previously malfunctioning regions. But as with genetic manipulations and the unknown space that characterizes the genomic universe, so too is the situation unchartered in the neuronal universe. Two patients suffering from chronic pain were implanted with impulse generators and subsequently developed profound *addictions* to the stimulation. In addition to relatively successful pain reduction, both patients experienced an enhanced desire for sex, including erotic feelings. One of these patients self-stimulated so often that she forgot to wash, change clothes, and adhere to family commitments. What happened? Did the clinicians treating these patients hit the pleasure center? When stimulated, what actually changed in the minds of these patients? Did they simply *want* more sexual arousal, suggesting that stimulation turned up the gain on their desire for sex? Or, did stimulation change what they *like*, a shift in the sense of pleasure that accompanies sex, and in this case, the anticipation of sex? Or perhaps it changed both wanting and liking, especially since we often want things we like?

These observations of how humans and rats respond to brain stimulation show that particular areas of the brain are linked to pleasure, especially the motivation to obtain rewarding experiences. These

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observations also reveal that when these areas are activated, they can result in addictive, uncontrollable behaviors that are toxic to self and others. They suggest that areas of the brain associated with desire can run out of control. But to understand how the brain motivates us to *want* some things but not others, how it creates the experience of *liking*, and how it enables us to want things we like by *learning* about the world, we must turn to experiments on nonhuman animals, brain scans of healthy humans, the mechanics of mind-altering drugs, conscious and unconscious influences on our choices, and the sad stories of individuals with uncontrollable urges to eat, drink, snort, shoot up, and gamble. This is the evidence that scientists, especially the American cognitive neuroscientist Kent Berridge, have gathered to explain the three core elements of pleasure: wanting, liking, and learning.

Often, but not always, the experiences we want or desire are the experiences we like. Often, but not always, the experiences we like are rewarding and good for our health. Often, but not always, we are aware of the experiences we like, and make rational plans to experience them again. Often, but not always, our rational plans to experience what we like makes us happy. Often, but not always, we find ways to maintain our happiness by using self-control to moderate our exposure to pleasurable experiences. The *often* refrain refers to the fact that the systems involved in wanting, liking, and learning work in this way most of the time. The *but not always* refrain is a tip off to exceptions that speak to interesting aspects of the machinery. For example, though we most often want things we like, we can want things we don't like and like things we don't want. I want to lift weights, do push-ups and sit-ups to stay fit, but I don't really like doing any of these exercises. I like the Porsche Boxster sportscar, but don't want one because it is a gas guzzling environmental nightmare and inconveniently small for a family car. The fact that wanting and liking can mount a unified front or conflict with each other shows that it is important to look at the glue between them, which is learning. Learning allows us to work out our values, setting up a preference profile for what we desire in the people we interact with, the places we visit, the objects we handle, and the events we experience. Learning allows us to predict situations that generate pleasure or pain. Though we are conscious of many of these processes, and can actively influence them, unconscious processes are also at work. These systems of the brain link us to our evolutionary past, and to animals without language but clearly expressed likes and dislikes.

Evolution has endowed all animals with unconscious wanting systems — brain circuitry that motivates individuals to seek resources that enable survival and reproduction. For young mammals, still dependent upon parental care, their desires are simple: milk and warmth from their mothers, and depending on the species, additional warmth and protection from fathers; for the record, the human father is an oddity among primates, as no other ape and virtually no other monkeys express a paternal instinct. With growth and independence, desires shift to other resources that can satisfy hunger and thirst, accompanied by sexual and social status desires. Though driven by unconscious operations, the behaviors

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that result are often strategic, dependent upon changes in climate, other competitors, who happens to be in a bad mood, and who is sexually active. In a variety of species, from dung beetles to deer, biologists have developed mathematical models that accurately predict how long an individual should wait for a sexual partner or feed in a food patch. The accuracy of these models shows that individuals' desires for resources linked to survival and reproduction are captured by lawful principles or rules. This is important because it means we understand how the machine underlying behavior works. It means we understand how animals make certain choices.

Understanding how wanting works is straightforward. In both humans and nonhuman animals, we can measure what individuals approach when we give them a choice, as well as how much effort they are willing to exert while approaching and gaining access to a particular object or experience. For example, in studies that explore whether captive animals are provided with sufficient housing conditions, an experimenter presents individuals with a choice of rooms, one consisting of the typical housing environment and the others by the addition of goods believed to be of interest. To enter a given room requires opening a door. To determine how much an individual really wants what is in another room, the experimenter ramped up the difficulty of opening each door. In studies of captive hens and mongoose, individuals exerted considerable effort to open some doors but not others. Hens rammed into doors opening onto a chipped wood floor, whereas mongoose did the same for a pool of water. These are items they want, but do not get in captivity.

What about liking? It may seem, at first blush, that because liking is a subjective experience, that there are no clear objective ways to measure it. My likes are my own. You can't possibly know what it is like to be me. If you can't know what it is like to be me, then we can't possibly know what it is like to be a mongoose, mouse or monkey. There are, however, ways of measuring liking and disliking that are reliable, objective, and consistent across species. In many animals, including human babies who can't speak and human adults who have lost this capacity due to brain injury, there are distinctive behaviors that are consistently linked to positive experiences and others linked to negative ones. For example, in mice, monkeys, and human babies, tasting something sweet like sugar causes a lot of lip licking, whereas tasting something bitter such as quinine causes mouth gaping, nose twitching, and arm flailing. These similarities show that evolution has been conservative, maintaining the same underlying mechanisms for handling likes and dislikes. These similarities have enabled scientists to understand how the brain systems involved in wanting and liking can change together or separately, even though they can't help us understand the harder problem of what, in particular, it is like for a given mouse, monkey or man to like something.

To understand the machinery that drives rodent wants or desire, Susana Peciña and Kent Berridge took advantage of the genetic technique that Joe Tsien —mentioned in the last chapter— used to create

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smart mice. Recall that Tsien jazzed up a gene's expression to improve memory and learning. In contrast, Peciña and Berridge quieted a gene that controls the amount of dopamine floating around in between neurons. With this gene silenced, dopamine levels increased. Compared with normal mice, these dopamine-plus mice consumed twice as much food and water, and learned much faster where food was located within a maze. But when it came to measuring licking as liking, the dopamine-plus mice were no different from normal mice. Dopamine is therefore essential for the wanting system, but not the liking system. This conclusion has been supported by many other studies, of mice and men, in the context of eating and drug addiction — two topics that I will shortly revisit.

To understand what rodents like, Peciña and Berridge injected an opioid drug — similar to opium from poppy plants — into two brain regions associated with reward — the nucleus accumbens and the ventral pallidum. Not only have studies of rodents, monkeys, and humans revealed that these areas are associated with reward — recall the brain stimulation studies — but they contain sub-regions known as *hedonic hotspots* — zones tuned to particular kinds of stimulation, designed to jazz up the liking element of pleasure. Following injection, individuals licked four times more often in response to sugar as the non-injected individuals, but did not show a difference in wanting. The opioid injections also caused a decrease in the aversiveness of bitter quinine, as evidenced by a decrease in mouth gaping. Turning on these hedonic hotspot ramped up the pleasure of sweets, and diminished the displeasure from bitters. Together, the Pecina and Berridge studies highlight the independence of wanting and liking, and the ways in which the brain — or a clever experimenter playing with it — regulates the elements of pleasure.

How does the brain figure out what's hot and what's not, delicious or disgusting? It's one thing to desire a particular experience, and another to derive pleasure from the experience. But the world is not set up with labels that indicate which objects and events are pleasurable and which distasteful. Every object and event has particular properties that, depending on the animal's sensory ability, can be seen, heard, tasted, smelled, or touched. For all organisms, there are receptors within each of the sensory modalities that are biased to prefer some things over others. This is why no human baby has to be taught to dislike bitter things and like sweet things. From the very first encounter, sugary solutions trigger tongue protrusions and licking, whereas bitter solutions trigger a gaping mouth. We have evolved, as have other animals, sensory systems that are tuned to prefer some things and dislike others, right from the start. These initial biases guide the learning process, facilitating acquisition of new knowledge in some cases, making it almost impossible in others, and setting a course to self-destruction in yet others. Try teaching a young child that the taste of sweet chocolate is disgusting while the taste of bitter endives is delicious. Try teaching cocaine addicts to turn off the magnetic pull of white powder, or convincing alcoholics that the clinking sound of ice in a glass isn't meaningful. Try teaching rogue soldiers involved in genocide

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that the parasitic enemy shouldn't be exterminated. This is where scientific explanation gains considerable interest, helping us understand how we develop anticipatory pleasures and past-oriented regrets, struggle to change from habitual rewards, and acquire irrational desires for experiences we no longer enjoy — a problem that appears to maintain most forms of addiction.

Humans go to restaurants and bees to flowers because both are associated with food. Within these broad categories, there are good restaurants and flowers, as well as bad ones, where good and bad are determined by experience. The experience can be direct, as when food is actually consumed, or indirect as when humans listen to an animated friend describe a restaurant's menu and bees watch a hive mate dance, providing a description of the flower's location and quality. Once the association between food and location is established, simply seeing the restaurant or flower triggers a cascade of neural and chemical activity in the brain linked to reward and the anticipation of pleasure. The restaurant and flower are cues that predict food. If you walked into your favorite restaurant and found that they sold fertilizer rather than food, you would be heartbroken. If you haven't been to the restaurant in a long time, but memorialized your previous experience as a gastronomic high, you will be deeply disappointed if your first bite doesn't live up to the standards you anticipated. This mismatch between anticipated and experienced reward will lead to a cascade of brain activity — indicative of an error. The primary engine driving the experience of reward, including predicting when it will occur and with what kind of intensity, is the dopaminergic system, a network of brain areas that releases dopamine in most invertebrates and vertebrates, including the human vertebrate.

Many natural behaviors trigger dopamine, including male songbirds singing to attract females, rhesus monkeys seeing a red light that has been associated with a soon to be delivered shot of juice, and humans cooperating with each other. Many unnatural behaviors and objects can also trigger dopamine. Animals trained to press a switch for food, will often become obsessively attracted to the switch, caressing and biting it even in the absence of food; humans with addictions to cigarettes, food and gambling, will often obsessively fondle an empty cigarette carton, fork, and deck of cards, respectively. But these correlations leave open the question of whether dopamine causes the anticipation or experience of reward, or flows from these experiences.

To tackle the causality problem requires experiments, either directly changing dopamine concentration or comparing individuals who, due to genetic differences, show differences in dopamine levels. We know from studies of rodents and monkeys that selectively increasing dopamine with drugs results in heightened wanting of food if there are cues to foraging, or sex if opportunity knocks. The Israelian cognitive neuroscientist Tali Sharot pursued a similar approach with healthy humans subjects. She first asked individuals to rate how happy they would be if they vacationed in 80 possible destinations. Then, some subjects took a placebo while others took L-dopa, a drug that selectively increases the release

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of dopamine. Later, these same subjects imagined what it would be like to actually vacation in these places, and rated their imagined experience. Those on L-dopa felt they would be much happier, revealing the power of dopamine to cause changes in our experience of reward. Complimenting these experimental results are studies showing that genetic variation in the expression of dopamine in humans are closely tied to impulsive behaviors and behavioral disorders. Thus, individuals with genetic variants that result in higher levels of dopamine are more likely to engage in compulsive gambling and eating, leading to addictions. The anticipation of heightened pleasure leads these gamblers, eaters, and abusers to want more and more.

This work shows that dopamine is necessary for monitoring and guiding our desire for reward, with evidence of individual differences that start with our biology. This is a highly adaptive system. But changes in dopamine can also cause our desire for reward to runaway, like a brakeless trolley. This is a highly maladaptive process. This flip between adaptive and maladaptive that we see within the dopaminergic system is, by now, a familiar brain routine. It provides, I believe, the means to explain all manners of excess, from the desire for food and money to drugs and violence.

Obesity and drug addiction are disorders of excess. They are disorders of insatiable desire. There are many paths to obesity and addiction, but all ultimately point to changes in the reward system. In humans born with deficient levels of the hormone leptin, overeating and obesity are common outcomes. When these individuals view images of food during a brain scanning session, they show *lower* levels of activity in the striatum than non-leptin deficient individuals. The striatum is an area that is rich in dopamine and an essential part of the reward system. This may, at first, seem paradoxical: how could those who eat to excess not show an excess of activity in the striatum, and thus, an over-the-top experience of reward upon seeing food? The answer lies in studies of rodents and humans. Whether it is obese rats or obese people, both show compulsive eating, but lower levels of expression of dopamine in the striatum. If you silence a key dopamine gene in rats, you can quickly turn them into food junkies, driven by an unsatisfied wanting system. Overeating, like over-drugging, turns the reward dial down. This is an adaptive response, except when it operates in the mind of a food or drug junky. Though the reward hits are small and unnoticeable, the wanting system remains highly motivated, triggered by the same cues. What food and drug junkies want is more hits, but the reward system isn't delivering. This causes them to want even more.

What the work on obesity and addiction tell us is that independently of how people get started on the path to fulfilling their desires, and whatever leads them to over-consume, consumption loses its luster. The brain is smart: excess is bad and thus the reward systems turns off. But because the wanting or desire system is independent from the reward system, and has evolved insurance against a complete shut down,

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it continues to drive desire. Because the reward system isn't delivering the goods, excess unfolds driven by a wanting system that is looking for pleasure in all the wrong places.

When we were hunters and gatherers, excess was an unborn concept. We lived on the edge then, enjoying scraps of whatever kill arrived on the fireplace, together with the tubers gathered up on the day. We, at least many of us in the West, live in a world that has a 24/7 cafeteria of food and drugs. It is a want it-have it culture. As work in molecular biology shows, and as I will pick up in chapter 4, some of us start off more vulnerable than others, susceptible to sampling from the cafeteria at all hours of the day and night. The combination of a heavily marketed environment and a biological susceptibility to excess, is a losing combination for the consumer.

The work on addiction provides a template for thinking about how individuals and societies ignite a path to excessive harms. In the same way that excessive eating gets going and going out of control when the dopamine system drives an irrational desire to want more and more food that is liked less and less, so too is excessive harm often driven by a similar decoupling between wants and likes. Individuals start with a desire to acquire wealth, to physically harm those who are unlike them, or taste the sweetness of revenge against someone who acted unfairly. These desires are often linked to an experience of pleasure or the anticipation of pleasure. But as such actions and their consequences accumulate, the pleasure derived diminishes, as money is acquired just for the sake of having more, while individuals are injured, maimed, or killed because this is the policy that must be pursued. Liking is no longer part of the equation, leaving cold desire to do its work at the expense of innocent others who get in the way.

To develop this idea, and especially the link to excessive harm, I have to fill in a missing piece in our discussion of desire. Everything I have discussed in this section has focused on individuals and their core corporal needs for survival — or in the case of drugs, recreation. I haven't said a word about how desire works in the social arena, whether the same systems are in play when we compare our own desires and resources with others, or with other opportunities. When desire is motivated by what others have or have achieved, are the same processes in play as when we eat, drink, or gamble? These are important questions as the desire to accumulate great wealth or to harm others is often motivated by comparison shopping, assessing what others have relative to our own status. The most primal starting point for comparison shopping is the world of hierarchies, a world where the desire to dominate rules.

Power hungry

Whether you are observing a social insect, fish, lizard, bird, rat, whale, monkey, or human, males are bigger and bolder, more boisterous, brash and brazen, and more motivated to get into a brawl than females. Though biologists don't define the sexes based on these differences, they use them to understand

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what drives competition for valuable resources and what determines the criteria for dominance status. Biologists define the sexes based on differences in the gonads, the reproductive organs that generate eggs and sperm, and the corresponding effects of sex-specific selection on the mind, body, and behavior. Females are those with larger, more costly gonads, where cost is defined on the basis of how much energy is invested in production. Think eggs versus sperm. This difference sets up an immediate competition, especially for species that have parental care. Once you invest in a big expensive egg, you don't want to lose your investment. You want to protect it, avoiding harm and minimizing risk. On the other hand, if your investment is small, you are not only freer to take risks, but favored to do so.

These ideas started with Charles Darwin. One hundred years later, they were developed in exquisite detail by the American evolutionary biologist Robert Trivers. Combined, they provide an explanation for why, in most species including our own, males compete with each other for access to females — the most valuable and limited resource — and why females are picky, expressing an aesthetic preference for males of a particular quality. Selection favors parts of the body and brain associated with dominant males and picky females. Dominant males win fights against other males, and thus gain access to females. Dominant males take risks and are more aggressive. Picky females hold out for the best males, those who provide the most desirable resources. Picky females are patient, waiting for males with good genes, access to prime real estate, and the protective skills and motivation to defend them and their young. These are qualities linked to high status. These are qualities associated with the ability to obtain and control resources. These are the qualities that females desire.

Male desire for dominance is therefore nurtured by female desire for dominant males. Like appetites, these desires seek satisfaction. Like appetitive addictions that create devastating consequences for individuals, groups and nations, so too can our appetite for domination.

Recall from the last chapter that testosterone and cortisol play a teeter-totter role in aggressive competition. When testosterone is high and cortisol is low, the motivation to fight and defend one's resources is high. These two hormones, and the brain areas they impact, fuel the desire to maintain a competitive edge. Recall further that winners experience an increase in testosterone, and losers a decrease, and that testosterone is addictive. Testosterone is therefore part of the system that links the desire to outcompete and gain dominance status with the rewarding experience of winning and achieving high rank.

To attain high rank, including a competitive advantage over others with respect to food and mating opportunities, requires social knowledge. How tough is the alpha baboon or boss in a company, and what kind of support do they have from other individuals in the group? How sexually receptive are females when their hormonal cycles tilt them into a period of potential conception? What other males are interested in these females? Attaining and maintaining high rank also requires attention to cues that are

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continuously changing, including where someone is looking and parts of the body that signal power and sexual availability. The American neuroscientist Michael Platt carried out a clever series of experiments to understand how much male rhesus monkeys value different kinds of social information and how much they will pay to obtain it. As in our discussion of wanting and liking, Platt rightly assumed that rhesus monkeys would value most what they like most, and that they would pay the highest price for what they are most motivated to acquire.

Each monkey watched a slide show with viewing options akin to pay-per-view television. On a given trial, they could watch one of two images for as long as they liked, each viewing option associated with a particular amount of juice. For each pair of images, one delivered more juice than the other. Given that these were thirsty monkeys , they should prefer more juice over less juice. If monkeys have no interest in the images per se — because they have no value — then their viewing preferences should be strictly determined by where they can get the most juice. If, on the other hand, the images have value, and some images are more valuable than others, then they may be willing to look at an image that delivers less juice over an image that delivers more. This is costly viewing. This is paying for watching. Evidence for such preferences would reveal that rhesus monkeys value the social information that comes from the image over the juice itself, a surprising result given that juice is a primary reward whereas the image is only a secondary reward, indicative of things to come.

Consistently, these male monkeys had two favorite channels, preferring those showing pictures of high ranking individuals and close-ups of female hindquarters. They preferred these over images of low ranking individuals, despite the fact that this choice often cost them the opportunity to drink more juice.

Platt's findings show that monkeys are motivated to acquire information about socially relevant situations, including information about dominance and sex. Their motivation or desire to obtain this information is high, as evidenced by the fact that they are willing to pay a cost. Keeping an eye on a dominant is of value as dominants pose a threat, especially one staring at you. Keeping an eye on a female's hindquarters is also of value as it can signal sexual receptivity: in rhesus monkeys, as in many other monkeys and apes, the area around the vagina either swells, turns red, or both when females are ovulating. This is important information for males in their attempts to court and mate females. I will quickly pass over the potential implication of these results for thinking about the origins of pornography.

Humans also value social information, with many hours in a day devoted to obtaining such information through gossip. Many of us live in a world where dominance matters, whether it is climbing to the top of a corporate chain or attaining the title of heavyweight champion of the world. Individuals seek high status because of the physical and health benefits that accrue. In such societies, our sense of self is based on our comparison with others. It is also based on a strong sense of independence, autonomy, assertiveness, and uniqueness. In other societies, the self dissolves into the other, with an

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emphasis on inter-dependence, commonness, and openness to change in response to authority. These differences in self-perception show up when we attend to faces of familiar individuals. Chinese subjects, representative of a collectivistic and inter-dependent society, responded more quickly to seeing their boss's face than seeing their own face. In contrast, American subjects responded more quickly to their own face than to any other person's face, including that of their boss. Like Platt's monkeys, therefore, we too place value on social information. Unlike Platt's monkeys, our sense of value in the social domain is modulated by our cultural upbringing. This modulation, and the brain states that accompany it, shows up in direct comparisons of individuals who are motivated to attain high dominance status with those who are motivated to create equality.

The American social psychologist Joan Chiao used survey information to establish two groups of individuals based on those who preferred to live in an egalitarian society and those who preferred a hierarchical society. These individuals then entered a brain scanner and viewed pictures of people experiencing pain. Two areas, both associated with the personal experience of pain and the perception of pain in others, were highly active. But these areas were less active in those who preferred hierarchies than those who preferred egalitarianism. This finding, as Chiao notes, is consistent with the idea that in an egalitarian society, empathy for others well-being is essential. In egalitarian societies, seeing someone who has less or is being harmed by another, should motivate a desire to redress the imbalance and reduce the harm. In a dog-eat-dog hierarchical society, where dominants outcompete subordinates and inequities are part of life, concern for those at the bottom is a sign of weakness. These results show how cultural influences can shape brain activity, leading some to develop deep desires for dominance and inequities, whereas others develop deep desires for equality. These brain areas heighten our sensitivity to what others have, what we desire, and how our desires are modulated by what others have. These comparisons motivate us to improve our status either by working harder — a good thing — or taking down those above us — a bad thing.

I'll have what she's having

One of the most famous lines in movie history was delivered by Estelle Reiner in *When Harry Met Sally,* a comedy produced by her son Rob Reiner. While Estelle is seated at a table in a delicatessen, Sally — played by Meg Ryan — fakes having an orgasm to show Harry — played by Billy Crystal — that he can't tell the difference between fakes and the real deal. Overhearing Ryan's performance, Estelle turns to the waiter and says "I'll have what she's having." This is comparative shopping, cashing in on

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someone else's subjective experience to guide our chosen experiences.

Orgasms and eating are two of the great pleasures in life, whether you live in Tokyo, Toronto, Toulouse, Tehran or Timbuktu? I doubt any healthy human adult would debate this. What can be debated is what counts as the ultimate orgasm or food experience. It can be debated both among friends and inside our own minds, influenced by personal experience and our knowledge of what else is available, or might be.

Consider potato chips. As a snack, potato chips generate a revenue in the United States of about $6-7 billion dollars each year, relying on the slicing and frying of about 2 billion pounds of potatoes. These facts make clear that most Americans love potato chips, and are motivated to consume them. Like other salty snacks, it is hard to eat just one. The American psychologist Carey Morewedge and his collaborators ran an experiment to find out how much people love potato chips, and whether their anticipated fondness for this delicious crisp changes in the face of other options. Subjects sat at a table in front of a bowl of potato chips and an alternative food that was visible, but out of reach. The alternative was either a highly undesirable snack such as sardines, or a highly desirable one such as Godiva chocolate. After subjects contemplated what it would be like to eat each of these foods, they then rated how much they would enjoy them. This is like the study I described in the pleasure section where subjects rated how much they would enjoy different vacation destinations, but without the comparison between one clearly good and one clearly bad spot. Both focus on the anticipation of a pleasurable experience.

Subjects' ratings of potato chip deliciousness soared when sardines were on offer, and plummeted in the presence of chocolate. Context matters. What is clearly delicious when there is nothing else on the table, loses or gains in deliciousness when the table fills up with other delectable or disgusting alternatives.

What's happening to our pleasure detector, and especially our anticipated reward system, in the potato chip experiment? Are we incapable of understanding what makes us happy, unable to figure out what is or is not delicious, or are we fickle? What Morewedge's experiment reveals is that deliciousness, like ugliness, stubbornness, and obsequiousness, is a judgment, judgments are always relative or comparative, and as such, based on some standard that is either present in the moment, stored away in our memories, or anticipated in the future. When Estelle Reiner uttered her famous line, she was using Meg Ryan's orgasmic expression of delight as a comparative metric. When we compare food items or wine or pretty faces or sporty cars, we recruit our brain's resources, especially the circuitry involved in attention, emotion and memory. Whether we say that potato chips are the best snack, or better than sardines, we have made a comparison that requires our attention, our capacity to keep at least two items in memory, and a way of emotionally tagging each of the items. This comparison-shopping taxes our mental resources, recruiting them away from the job of evaluating one snack, and leading to a distorted

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evaluation of desirability.

Morewedge's experiments point to a mismatch between how delicious something is and how delicious we think it will be, or how delicious we thought it was. It reveals a distortion in our capacity to anticipate — or *forecast* in the words of the American social psychologist Daniel Gilbert — how we will feel, and in particular, how much we will like the experience. This is a problem for the elements of pleasure that I laid out earlier in this chapter, as we expect the system that links wanting and liking to be well honed, even optimized to make sure that we really want things we really like. Is this distortion something to expect across the board, independently of context, or is it specific to our food? Is the social domain similarly vulnerable to a distorted view of anticipated pleasure?

Consider revenge. When someone transgresses over the borders of social norms, either harming us or those we care about, we often seek revenge, motivated to even things up. We often imagine that revenge will make us feel better, providing a honey hit to the brain that will satisfy our desire to redress an imbalance. But is this the outcome we consistently achieve when we follow through on a plot of revenge or, as Sir Frances Bacon noted over three hundred years ago, might "A man that studieth revenge, keeps his own wounds green, which otherwise would heal, and do well." In more modern and plain English, might our desire for revenge inoculate us against healing, creating an illusion that we will feel better? If so, revenge looks like an addictive process, with wanting unhinged from liking.

The American psychologist Kevin Carlsmith set up an experimental game that allowed each subject within a group to contribute money to a public good. At the end of one round, the bank multiplied the total by a pre-determined amount, divided this total by the number of players, and then redistributed this amount to each player. In this game, the best for each player in the group is to contribute to the common pot because this maximized the returns. However, the best strategy for an individual is to defect, holding on to the initial endowment while reaping the rewards of everyone else's generous contributions. Those who opt out of cooperation in a public good situation stand to benefit, especially in a world with no punishment.

Carlsmith created an experimental world of punishment for some players, but not all, and then explored how punishment contributed to a subject's feelings. Some could pay to punish, some witnessed the consequence of another's punitive act, and some had no exposure to a game involving punishment.

When given the opportunity to punish the defector, most people punished. Everyone, both punishers and non-punishers alike, expected punishment to feel good. They were wrong. Both punishers and those who witnessed punishment felt worse, with the act of punishment compounding the bad feelings. The fact that the witnesses felt worse, as opposed to better, may seem at odds with our experience of schadenfreude, of enjoying another's misery. Shouldn't the witnesses have rejoiced upon discovering that the offenders were slapped with a punitive fine? In our own personal experience with

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schadenfreude, as well as in studies that I will explore in a few sections, witnesses learn of a misfortune that happens to another but this news has no direct bearing on the witness. In Carlsmith's experiments, the witnesses learn of a misfortune, but the offender's defection has a direct bearing on the witness in terms of money lost. Thus, although punishment may feel good, the benefit may not make up for the lost income.

Everyone in Carlsmith's experiments also believed that punishment would cause people to think less about the offender. They were wrong again. Punishers, but not those who simply witnessed punishment, ruminated more about the selfish offenders. Rumination led to more bad feelings. These bad feelings led to more rumination, giving birth to a vicious cycle of feeling bad and ruminating about those who cheated them of some money. Rumination heightened the comparative difference in resources.

Carlsmith's findings are paradoxical and disturbing. Paradoxically, they suggest that in some situations, our expectations about the feeling of punishing an immoral act are inverted from the feelings we feel following punishment: rather than feeling a happy high, we feel a depressing low, often accompanied by increasing anger. In the context of punishing a free-rider who stiffed the group, everyone expects to feel a tingle of delicious delight, but many end up feeling angry instead. The entire polarity of the emotion has switched, with rumination and anger dominating our thoughts. This is a dangerous state to enter. Faced with the strong belief and desire that revenge should feel good, but lacking any confirmation, we are moved to find new evidence. With anger at the helm, there is only one solution: escalate the level of punishment, and continue to do so until it feels good. This is precisely the pattern I described above for obesity: the wanting system continues to search for liking and reward, but fails, and thus continues. Whether it is an unsatisfied desire for food or revenge, the unfortunate consequence is an escalation to excess. Evil isn't far behind, fueled by a variety of situations in which we fail to obtain what we want.

The great leveler

We are often envious of those who have what we desire, whether it is good looks, money, a warm supportive family, or a better tennis stroke. Envy can motivate us to change our looks, find careers that will improve our finances, seek relationships that will provide additional support, and pick up a few extra tennis lessons to win the next match. Unfortunately, envy can quickly turn, as desire and a deep sense of inferiority transform into insatiable cravings to acquire whatever is necessary to gain superiority. Envy thus wears two masks, one benign and inspirational, the other malignant and destructive. As the writer Dorothy Sayers noted, envy "is the great leveler; if it cannot level things up, it will level them down."

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Envy emerges out of our sense of fairness, fueled by competition. It is part and parcel of a hierarchical society. When we envy someone, we have detected a difference or inequity between our own condition and that of another. We want what someone else has, presumably because we like what they have. Wanting and liking are in harmony. Recognition of the inequity fuels competition to redress the imbalance. This sense of fairness appears early in child development, changing in systematic ways as a function of a culture's norms.

The Swiss economist Ernst Fehr, who led the brain imaging studies of punishment and reward discussed in Chapter 1, assembled a team of developmental psychologists to test for evidence of fairness in young children ages 3-8 years old. Fehr was especially interested in when children recognize a disparity or inequity in the distribution of resources, and what they are willing to do, if anything, to redress the imbalance. The experimenter paired up each child with a partner of the same age who was either from the same school or a different school; the school distinction was set up to look at in-group versus out-group differences which, as discussed in chapter 1, can lead parochial altruism — the paradoxical result of greater cooperation among group members and greater hatred and violence toward those outside. Though each child knew about their partner's age and school affiliation, they never saw their partner. Each child therefore knew only that they were playing with *someone* from their school or *someone* unfamiliar to them.

Each child played three different games. In each game, the experimenter told one child to decide how to distribute a fixed amount of candy. In the *prosocial* game, the decider either takes one candy and gives one to the partner or takes one candy and gives nothing to the partner. If children are sensitive to inequities and want to share in order to make things fair, they should pick the 1-1 option; picking the 1-0 option doesn't affect the decider, but dings the partner. In the *envy* game, the decider has a choice between 1-1 and 1-2. As in the prosocial game, the decider gets the same amount of candy with both options, but preserves equity with 1-1. Picking 1-1 also reveals that the child has an aversion to others having more, even when there is no personal cost. In the third, *sharing* game, the decider has a choice between 1-1 and 2-0. Here again, the decider gets candy in both cases, but the 2-0 option tempts the desire for more, both personally and relatively. On the one hand, a greedy child will want more candy, and so 2 wins over 1. But picking the 2-0 option also leads to a greater difference with the partner, while robbing them of an opportunity for any candy. If fairness prevails, deciders should pick 1-1. If selfishness prevails, motivated by competition, they should pick 2-0.

Across all three games, there was an increasing tendency from age 3 to 8 years old for children to pick the fair distribution (1-1). Across all ages and games, children were most likely to pick the fair distribution when playing against familiar than unfamiliar schoolmates. What these results reveal, together with many other similar studies, is that children are sensitive to the distribution of goods at an

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early age, but with important developmental changes in play. There is a tendency for children to both recognize inequities early in life, but to act selfishly when possible. The envy game shows this beautifully. When another child could receive more, children rejected this option even though it wouldn't cost them directly: the decider always gets just one candy. Though no one has yet worked out what causes a developmental shift from more to less selfishness, most agree that it is driven by maturation of brain regions guiding self-control, together with social factors that make young children increasingly aware of and sensitive to their own and others' reputations. Fehr's studies also show that playing fair is not just about the distribution of resources, but about who gets them. Early in life, children have already carved up the world into those they know and those they don't. This division drives their thinking and feeling, and in cases like this, their sense of fairness. Young children are well on their way to developing parochial altruism.

Fehr's research, and the majority of studies on the child's developing sense of fairness, focus on children living in large-scale Western societies. Most of the work on fairness in adults is similarly focused on large scale societies. The precise structure of these societies may directly impact how individuals decide when to share, what commodities enter into the distribution, and whether sharing depends on effort invested, needs, and power. As noted in the last section, those who support an egalitarian society are more likely to feel empathy toward those in pain than those who support a hierarchical society. Individuals who are more empathic are also more altruistic. Hunter-gatherer societies tend to be more egalitarian, and highly cooperative. These differences predict further differences in how those living in small-scale societies, including the hunter-gatherers and subsistence farmers of Africa, Asia, and South America, should respond to unfair exchanges.

The American anthropologist Joseph Henrich and his colleagues presented a set of bargaining games to adults living in different small-scale societies across the globe. Though the subjects in this study played a number of different games, the basic goal was similar to those deployed by Fehr in his studies of children and adults: under what conditions will individuals choose to share an equal as opposed to an unequal distribution of resources?

Consider the ultimatum game. One individual decides how to distribute a fixed amount of money to an anonymous partner; in the Henrich games, he always used the local currency and an amount that was appropriate for the society. The partner had two options: keep what is on offer or reject it. Rejection is costly to both players as they leave empty handed. Rejection is both an expression of sour grapes for what could have been — a fair offer — and punishment for selfish behavior. In large scale societies, offers typically range from 40-50% of the initial pot, and rejections are common for offers less than about 20%.

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Across the globe, most people in these small scale societies offered some amount of the initial pot. Across the globe, most people rejected really low offers. This shows the universal signature of fairness: an expectation of sharing resources and a no-tolerance view of greed. Cultures differed with respect to how much they shared and whether they rejected. Some societies offered, on average, close to 40%, while others offered as little as 15%. Some societies accepted virtually all offers, whereas others rejected both low and even high offers. Even in more egalitarian societies, therefore, there is sensitivity to unequal distributions. Even in egalitarian societies, there is a willingness to punish those who act unfairly, greedily taking more than their fair share.

The work I have discussed on fairness is only a fraction of the growing body of scientific evidence. What this research reveals is that a sense of fairness is part of human nature, appearing early in development, but guided by experience toward a particular cultural form. When our desire for fairness or equity combines with our competitive drive, envy often follows. Studies of the brain show how envy is generated from this combination.

When healthy subjects sit in a brain scanner and learn about other individuals who have what they desire, there is considerable activity in the anterior cingulate, and more activity in those who feel more envious. This is not the envy center of the brain. There is no such area. But the recruitment of the anterior cingulate in other social situations helps us understand what is going on more generally in the case of envy. The anterior cingulate activates when we experience pain from social exclusion, but not when we witness such pain in others. It is one of the areas that was activated in Chiao's work on the differences in pain empathy for those supporting either an egalitarian or hierarchical society. The anterior cingulate is also involved when our minds are pulled in two different directions, a situation that arises when we are forced to choose between two conflicting moral options — for example, a duty to save the lives of many versus the prohibition of killing one person to save the lives of many. There is a common thread here that unites these different experiences. Like our experience of social exclusion, envy is also a form of social pain and to some, deeply painful, as it reveals a sense of deficiency in acquiring resources. Envy also represents a situation in which our positive sense of self conflicts with the negative sense of self engendered by social comparison. Our brain — and the anterior cingulate in particular — informs us that we are less accomplished when compared with others. Envy is socially imposed pain generated by comparison shopping.

Envy highlights what we don't have, which fuels the system of desire, which seeks satisfaction. Unsatisfied, envy runs wild. Unsatisfied, wanting keeps hunting for pleasure. Schadenfreude delivers some prey.

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O Schadenfreude

On February 15, 1978, a relatively unknown boxer with few professional fights, stepped into the Las Vegas boxing ring and snatched the world heavyweight champion title from Muhammad Ali. Ali, along with his entourage of managers, coaches and fans were shocked, though no one denied that he lost. The unknown boxer was Leon Spinks. His only prior claim to fame, and ticket to a shot at Ali, was an Olympic gold medal two years earlier. With this win, not only did Spinks enjoy the heavyweight belt of champions, but a cash prize of $350,000 and a promise of $3.8 million for the rematch with Ali. But this meteoric rise to the top fizzled into a meteoric crash, driven by women, alcohol, sports cars, and a lack of training. Leon Spinks, aka "Neon Leon," was living the fast life, and rapidly losing his status as a respected sports hero.

Moments before his rematch with Ali, he cruised the streets of New Orleans on top of a limousine while smoking a joint. He was flaunting his nonchalance, making fun of Ali's age, and carrying on about his ability to take the old champ without a single work out. When he entered the ring, Ali was ready. Though the match went the full fifteen rounds, it was no contest. Ali won.

Newspaper writers and boxing fans celebrated the return of their champion, and mocked the downfall of an ephemeral, arrogant, and out of control hero. After losing to Ali in the rematch, Neon Leon crashed further, losing all of his earnings, taking on odd jobs for minimum wage, losing a son in a gang fight, and suffering defeat after defeat in the boxing arena. From envied millionaire sports star to bankrupt fool and the laughingstock of the boxing world.

When the envied fall down, we perversely enjoy the knock out. This is schadenfreude, a German word that describes the joy we feel in witnessing another's misfortune. Though the emotion is universally understood, recognized in our written records at least as far back as Aristotle, the German language is one of the few to capture the feeling by tapping the brain's promiscuity, combining the word for harm (*schaden*) with the word for joy (*freude*). Like envy, schadenfreude is a social, comparative emotion. It erupts when those we envy fall down, when someone we dislike meets his comeuppance, and when a misfortune is deserved. But like envy, schadenfreude presents two faces, one elevating and virtuous, the other deflating and divisive. We should feel good when a person is caught crossing a moral line, committing an injustice. Such feelings not only reinforce our own adherence to moral norms, but encourage us to punish those who transgress. Such feelings instill courage in the service of expressing moral outrage. As Robert F. Kennedy stated "Moral courage is a rarer commodity than bravery in battle or intelligence." Schadenfreude in this positive sense is the inner voice of moral courage. At the same time, it can also be the inner voice of moral disengagement, providing justification for an observed harm.

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When this happens, our promiscuous brain has worked its combinatorial magic, causing us to feel good when we witness someone else's misfortune.

Schadenfreude, like envy, causes us to self-evaluate, looking inside of ourselves to assess our net worth relative to others. We know from a large body of studies, several carried out by the American social psychologist Roy Baumeister, that when an individual's sense of self-worth is threatened, especially those individuals with more narcissistic and overly confident personalities, aggression often follows. The more personally threatened we feel, the more pleasure we should feel when someone else suffers. The Dutch psychologist Wilco van Dijk tested this idea with two simple experiments. In both experiments, subjects filled out a questionnaire that they believed evaluated their intellectual strengths. Upon completion and scoring of the questionnaire, some were told that they had utterly flopped, scoring in the lowest 10% of all subjects, while others were told that they performed brilliantly, scoring in the upper 10%. Next, all subjects read a scenario in which someone suffers a misfortune. For example, in one scenario, a student rents an expensive car to show off at a party, but then drives the car into a river, not only damaging the car but requiring the fire department to tow it out. Those whose sense of self-worth was threatened by the abominable test score were more likely to say that they felt good about the misfortune, including smirks and laughter in response to the show off who submerged his rented car. These results powerfully show that schadenfreude serves the beneficial function of hoisting our own self-worth. When our self-worth has been challenged, for whatever reason, we feel better knowing that someone else is worse off, regardless of context or direct relevance.

Our desire to see others suffer so that we may feel better can escalate to absurd levels, especially when it is fueled by ideology. Beliefs can blind us to the cost-benefit analysis, motivating us to see harm done to those outside of our inner sanctum even if it hurts us as well. Religious and political ideologies are two of the hotspots that can drive entirely irrational desires and absurd attributions.

The American psychologist Richard Smith explored whether an individual's political convictions influenced the intensity of schadenfreude when witnessing a member of another party suffer, including cases where society at large also suffers. Smith initiated the study prior to the US Presidential elections in 2004 involving Republican George W. Bush and Democrat John Kerry; during this period, the Republicans controlled both executive branches of the government. Each subject — all college undergraduates — provided information about party affiliation and strength of support for the policies and beliefs of their party. Next, every subject read and provided reactions to short newspaper articles describing tragicomic moments for the two candidates, one in which Bush fell off his bicycle while riding, and the other involving Kerry wearing a bizarre space outfit during a visit to NASA. Last, subjects read and reacted to an article describing job losses and the economic downturn facing the nation — an article meant to capture an objective cost to all members of society, irrespective of party affiliation.

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Unsurprisingly, Democrats expressed more pleasure from reading about Bush's bicycle accident, whereas Republicans were more joyful over Kerry's bizarre space suit. Surprisingly, Democrats also expressed pleasure from reading about the economic downturn, and more pleasure than the Republicans who were more likely to express negative feelings about this situation. Thus, despite the fact that the economic downturn hurt everyone, the Democrats expressed pleasure over the added damage this inflicted on the Republicans — who they held responsible — and conversely, the added benefit it brought to the Democrats who could wag their fingers.

In a second study, Smith found that Democrats experienced more schadenfreude than Republicans over the number of casualties reported out of the Iraq war, even though Iraqis were certainly not preferentially targeting Republicans. The pleasure they experienced was entirely driven by the fact that this was a war sponsored by a Republican government, and thus, the fatalities could be blamed on the Republicans. From a Democrat's perspective, even though everyone loses when soldiers die in war, it is a bigger loss for Republicans, and thus, a bigger gain for Democrats. With schadenfreude, it is all about comparative shopping. It is all about satisfying our desires relative to others.

As noted above, schadenfreude appears to emerge strongly when an individual's misfortune is deserved. To explore what is happening in the brain when such pleasure is experienced, and the situations that might trigger it, the German cognitive neuroscientist Tania Singer set up a study involving healthy men and women. In the first phase, subjects played a bargaining game for money against an unfamiliar partner; prior to the game, and unbeknownst to the subject, Singer set things up so that the partner played either fairly or unfairly. After the game, each subject entered a scanner, and watched their partner receive a painful shock to the hand.

Predictably, Singer discovered that both men and women liked the fair players better than the unfair players, and showed more empathy to fair players when they were shocked. Proof of empathy was read off the images of brain activation, especially the brain circuitry known to be involved in pain empathy, and mentioned earlier in my discussion of Joan Chiao's work on social hierarchies: the insula and anterior cingulate. Unpredictably, Singer discovered that the level of activity in this pain empathy circuitry was reduced when men — but not women — saw unfair players receive pain. She also observed that in men — but not women — there was increased activity in the nucleus accumbens — an area mentioned earlier on that, in rats, monkeys and humans is consistently associated with the experience of reward and liking. The more individual men desired revenge for an unfair offer, the more activity they showed in this reward area.

Singer's findings are joined by many others showing that the nucleus accumbens, together with other reward areas, are activated in a wide variety of situations in which we gain from others' pain. But because these same areas also respond to non-social, non-comparative experiences, such as eating, we

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come back to a critical point in this chapter: areas that evolved for one function are readily recruited for others, especially in a promiscuous brain like ours. As long as something makes us feel good, whether it is winning, eating, social comparison, or harming another, the reward areas of the brain turn on.

Schadenfreude is one of the mind's ambassadors, enabling us to journey from a state of inferiority to superiority. It enables "imaginary revenge" in the words of German philosopher Friedrich Nietzsche. Like envy, it is highly adaptive, focusing our attention on inequities. Like envy, it is also maladaptive, rewarding us when the inequity is not only addressed, but results in another's failure and misery. If failure is associated with violence, including death, so be it. The brain is poised to inspire our desire to harm or witness harm in order to feel good.

An appetite for violence

Billions of people, perhaps all humans, have had vivid fantasies about sex, violence, or sexual violence. Are these fantasies like food fantasies, cravings that need to be satisfied? Or, as some theories would have it, are sexual and violent fantasies satisfying on their own, playing a cathartic role, releasing energy and thus, reducing the need to act out?

Seung-Hui Cho was born in South Korea and then moved to the United States with his parents. During his first three years in college, both students and professors in his literature and theatre courses described his writings as disturbing and disgusting, and his actions toward other students as ominous and frightening. One professor noted that his creative pieces "seemed very angry," while another demanded that he be removed from the class. A classmate noted that his plays were "really morbid and grotesque…I remember one of them very well. It was about a son who hated his stepfather. In the play, the boy threw a chainsaw around and hammers at him. But the play ended with the boy violently suffocating the father with a Rice Krispy treat." Cho was advised to seek counseling. He didn't. No one followed up. A professor aware of his often inappropriate comments and behavior contacted members of the administration. No response. Several women alerted the campus police after Cho stalked them. No disciplinary action was taken despite his repeated offenses. As in the SEC's tin ear to the alarms surrounding Madoff's dubious securities, so too was everyone at Cho's university deaf to his alarming behavior in class and out.

During his senior year, Cho wrote an essay describing his anger toward rich kids, the unfairness of life, and his own misery. He also described a revenge fantasy, packed with images of retaliation toward those who had what he lacked. He sent his reflections along with excessively violent photographs and videotapes to the New York headquarters of NBC news. Under a photograph of bullets he provided the caption "All the [shit] you've given me, right back at you with hollow points."

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On April 16, 2007, Cho dressed up in army fatigues. He left his dormitory and killed 32 people and wounded 25 others with a semi-automatic Glock 19 pistol filled with hollow-point bullets, designed to cause more tissue damage than traditional bullets. Cho then shot himself in the temple, ending his life and the Virginia Tech massacre.

Cho's case provides a horrifying example of how fantasies of violence can lead to real life enactments and a trail of blood. It also provides a counter-example of the catharsis view: Cho's fantasies about violent revenge did not make him feel better. It made him feel worse and more violent — a pattern supported by dozens of studies.

Normally raised children as young as seven years old are more likely to act aggressively toward their peers if they are self-absorbed in a world of aggressive fantasy, and this is especially the case for children who witnessed violence or were subjected to it. Adult men and women are more likely to crave violence after reading an argument in favor of the cathartic magic of violent fantasies than after reading a manifesto against catharsis. Men who engage in aggressive sexual fantasies are more likely to engage in aggression, but only if they are narcissists. Men who engage in deviant sexual fantasies are more likely to enact these fantasies, but only if they exhibit signs of psychopathy. Psychopathy and narcissism are like Siamese twins, inseparable. What these studies show is that those who are self-absorbed and play with violent or sexual fantasies, are most likely to take these imaginary worlds onto the real world stage.

Further evidence of the connection between violent fantasies and violent actions comes from studies by the German psychologist Thomas Elbert who studied child soldiers brainwashed into joining the ranks of the Lord's Resistance Army, Northern Uganda's rebel group. Since its inception in 1987, the LRA has recruited 25-65,000 children, starting with boys and girls as young as 10-12 years old. In detailed interviews and analyses of now retired child soldiers, Elbert discovered that those who had more experience with killing developed stronger, appetite-driven fantasies of killing, a hunger that had to be fulfilled by real killing. As one ex-child soldier noted "The more we killed, the more we acquired a taste for it. If you are allowed to act out this lust it will never let you go again. You could see the lust in our greed popping eyes. [...] It was an unprecedented pleasure for everyone." Not only was fantasy converted into killing, but the more they killed, the less they experienced any trauma in later life. Unlike the droves of veterans who have been returning from Iraq and Afghanistan, and suffer from post-traumatic stress disorder or PTSD, these child soldiers developed an immunity. Many of the veterans from Iraq and Afghanistan had no interest in killing, and deemed the war unnecessary. In contrast, these child soldiers were brain washed into believing that killing was necessary, and a sign of importance. Killing that is justified is rewarding, whether the justification is real or the product of self-deception. When self-deception joins the fray — as I further develop in chapter 3 — killing is not only rewarding but virtuous.

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Cho's case is not the exception, but the rule: persistent fantasies, whether sexual, violent, or sexually violent, are often played out in real life. When people voice their fantasies, we should open our ears. When therapists, especially those influenced by the catharsis view of the mind, encourage their patients to engage in aggressive fantasies to release their pent up energy, we should bring forward malpractice suits as they are accomplices to crime.

What kind of mind is most likely to rev up the fantasy world to supersonic levels and then unleash it in the service of excessive harm? Lust murderers — individuals with a craving for the bizarre and degenerate —provide one answer to this question. Lust murderers are typically repeat offenders or serial killers. The serial nature of their crimes comes from the fact that they are motivated by recurrent fantasies that create recurrent cravings. They are, effectively, addicted to violence. Their fantasies often entail some kind of paraphilia — an extreme and abnormal sexual arousal to objects, people or situations — played out through some form of sadism — a persistent pattern of sexual or non-sexual pleasure from humiliating, punishing and harming others. Here again we see the promiscuous human mind at work, seamlessly blending pleasure and violence, animate and inanimate attractions, sometimes with benign origins, but often with malignant outcomes. Thus, the pleasure derived from humiliation may develop out of the more common, normal and less harmful pleasure we experience from mockery and humor. Humiliation is just a small step away in a mind that derives joy from others' demise.

The paraphilias, like many of the other disorders that appear within the *Diagnostic and Statistical Manual of Mental Health,* fall along a continuum from rather benign forms of voyeurism to erotophonophilia, the vicious and sadistic killing of an innocent victim in order to achieve ultimate sexual satisfaction. Regardless of the particular object or situation driving the paraphilia, individuals become addicted. Like other addictions, including those associated with food, drugs, and alcohol, paraphilic addicts experience withdrawal. Dangerously for the world around them, the erotophonophilic or lust killer harbors sadistic paraphilias, including flagellation — the need to club, whip or beat someone — anthropophagy — the desire to eat human body parts — picquerism — a craving to stab someone or cut off their flesh, focusing especially on genitals and breasts — and necrosadism — a yearning to have sexual contact with the dead. Although these desires may seem unimaginable, they reveal one facet of the human mind's potential — a potential that was fully realized in the mind of Jeffrey Dahmer who flagellated, cannibalized, dismembered, and engaged in necrophilia with his 17 victims. Such disordered minds are part of the human condition, one that stretches from individuals who never cache in on their fantasies to those who not only deliver, but develop — as in addictions to food and drugs — deeper and deeper desires for harming others without the rewards that come from such harm. When wanting and

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liking part company, with liking falling dormant due to sensitization, wanting grows in intensity, seeking but failing to find satisfaction. So begins an appetite for violence, one that can turn into a craving.

A craving to impress

Gazelles on the Serengeti plains of Tanzania sometimes move in an exceptionally bizarre way. With legs rigidly extended, they bounce up and down like kangaroos. There is no obvious function associated with this movement. If anything, it appears energetically wasteful. If these gazelles lived in tall grass, one might think that the bouncing was designed to better see or be seen. But the Serengeti plains are flat and the grass is short. Gazelles can see for miles in this habitat and so can everything else that shares this gorgeous part of the planet with them. This includes the lions, leopards and cheetah that think of gazelles as breakfast, lunch and dinner. Why would a gazelle advertise like this? Why alert predators to your location and availability? Why not use the coloration of your fur to blend into the color scheme of the savannah, moving swiftly but imperceptibly?

We can explain the gazelle's bizarre movements — called *stotting* — by thinking economically, using Zahavi's honest signaling theory that I described in Chapter 1. Whenever evolutionary biologists see a behavior that is costly, they immediately search for a potential benefit. The reason is simple: behaviors that tax an individual's chances of survival and reproduction are ultimately weeded out by the force of natural selection. There must be some benefit to the individual or to others in order to neutralize the costs. Given the ostentatious nature of the gazelle's stotting, who benefits and how? Since the behavior is eye-poppingly interesting to human observers, one assumes that it is eye-popping to other animals on the Serengeti plains as well. Gazelles typically stot when they detect danger which, in the Serengeti, means leopards, lions and cheetah. If gazelles stot to alert other gazelles, then most gazelles should stot, at least some of the time. This is because all gazelles are vigilant, should have multiple opportunities to see these predatory cats, and should benefit from an alarm signal. But this is not what we observe. Instead, stotting seems to be reserved for those in good shape. When gazelles stot, they appear to be sending a cease and desist signal to any observant cat. If this is the gazelles' message, then cats should selectively chase non-stotters over stotters. And when cats turn a blind eye to stotting gazelles and chase them, they should have less success than when they chase non-stotters. Stotters are turbo-charged. Stotting is simply their way of showing off.

These expectations are supported by the British biologists Claire Fitzgibbon and Tim Caro who spent hundreds of hours watching gazelles and predatory cats. What they reveal is that stotting is an honest signal of condition or quality. Only gazelles in good condition can tolerate the costs of stotting.

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Stotting *handicaps* the individual, imposing a significant cost on the ability to move. But the cost paid is relative to the individual's condition. Without the cost and the ability to manage it, everyone could stot. And if everyone could stot, the cats would quickly figure out how meaningless it is and look for other cues to vulnerability.

Stotting appears excessive, but in fact is an honest signal of power. It is, to borrow a phrase from the economist Thorstein Veblen, "conspicuous consumption." By flaunting their superior condition, throwing away resources just because they can, these stotting gazelles benefit in the long run, living longer and leaving more offspring who will inherit their qualities. These ideas carry over into human behavior, from big spenders to, I suggest, big harmers.

The American anthropologist James Boone has suggested that human magnanimity evolved as did stotting, as an honest signal of wealth and power. It represents a desire to impress through wastage. Handicap yourself in the short run to benefit your wealth and status in the long run. Big tippers don't tip in private, but in the presence of those who can admire their lavish tips. Hunter-gatherers who bring home large prey from a day of hunting don't make cryptic deposits for others, but make sure that their offerings are public. The Mayan pyramids were not built for personal enjoyment behind walled enclosures, but in the open, visible to potential enemies as displays of excessive power to create something really big and costly. Rappers such as JayZ, Puff Daddy, and 50 cent don't have absurdly lavish cribs with a six pack of sports cars because this is what they like, but because this is what they can show off on MTV. Flaunting, even at a substantial cost, provides a path to power. This is a club whose motto reads "Impress with excess."

My suggestion is that excessive harms work as honest signals of wealth and power. Here we combine the HOW of evil — discussed in this chapter — with the WHY of evil — discussed in chapter 1. When millions are raped, slashed, burned, chopped up, gored, and dropped out of planes before dying, there are only two possible explanations: the evildoer is clinically mad with no sense of moderation or a healthy schemer who has allowed desire to run wild. The schemers are like stotting gazelles, wanting to impress others of their awesome powers by performing high risk displays. The schemers deploy proactive, premeditated, and cold violence — like predators. As the sociologist Wolfgang Sofsky noted in his commentary on the Nazi concentration camps "Individuals demonstrated commitment by acting, on their own initiative, with greater brutality than their orders called for. Thus excess did not spring from mechanical obedience. On the contrary; its matrix was a group structure where it was expected that members exceed the limits of normal violence." Unfortunately for society — past, present and future — the Nazis are not an isolated case. When Slobodan Milosevic, Radovan Karadic, and Ratko Mladic launched their ethnic cleansing initiative, they didn't just displace or kill Albanians and Croatians, they raped their women, old and young, in front of husbands, fathers, and grandfathers — and then killed man

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of them. Admiral Luis Maria Mendia, one of the leaders in Argentina's "Dirty war," convinced victims to board a plane under the pretext of a freedom flight, and then once in flight, were thrown out of the plane, adding sheer terror to the brutality of their death. Accounts such as these litter the pages of history. They reveal that the desire to impress with excess is part of human nature.

What we have learned in this chapter is that our biology hands us the tools for excess, and hands some of us more than our fair share. This does not mean that we will or must use such tools. It also doesn't mean that the tools were designed for excess. Some are endowed with genes that predispose to sensation-seeking and risk-taking, others to brain circuitry and chemistry that create an insatiable desire for reward. Different environments either encourage this biology or discourage it, a topic that occupies chapter 4. As the eighteenth century poet William Blake remarked "The road to excess leads to the palace of wisdom… for we never know what is enough until we know what is more than enough." To more deeply understand how our desires runaway to excess, we need to understand how the mind facilitates this process. We need to understand the role of denial. We need to understand how individuals and groups dehumanize the other and self-deceive themselves into believing that those unlike them represent a threat to their purity and power. We need to understand how desire and denial combine to pave the way to excessive harms.

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Chapter 3: Ravages of denial

Self denial is not a virtue: it is only the effect of prudence on rascality.
-- George Bernard Shaw

In October of 1980, a 39 year old man walked into the Royal Melbourne Hospital in Australia, having suffered a gun shot to the left side of his skull. Once the medical team removed the bullet fragments and cleared the blood clot, the man was able to speak. He had shot himself, aiming at his second head. Yes, his second head. This man believed that he had two heads, his own and the head of his dead wife's gynecologist. Before his wife died in a car accident, he believed that she was having an affair with her gynecologist. At night, the second head spoke, accompanied by voices from Jesus and Abraham who confirmed the existence of the second head. As the patient expressed to the interviewing doctor "The other head kept trying to dominate my normal head, and I would not let it. It kept trying to say to me I would lose, and I said bull-shit." "I am the king pin here" it said and it kept going on like that for about three weeks and finally I got jack of it, and I decided to shoot my other head off." Over a two year period, the perception of the second head disappeared. The attending neuropsychologist, David Ames, described the case as an example of schizophrenia-induced delusional bicephaly — a distortion of reality that creates a false belief of two heads.

Cases like this are bizarre. But like many neuropsychological reports, they force us to reevaluate our perception of reality, what's normal and what's distorted, what's adaptive and what's maladaptive. The Australian patient who developed delusional bicephaly was suffering from the loss of his wife. Loss and suffering motivate explanation, along with something or someone to blame: Was it really an accident? Why her? Why not me? What if she had stayed home that morning? What if I had been driving with her? Was she distracted by her lover? Was he in the car? These questions represent gaps in a narrative, holes that we attempt to fill, often by distorting reality.

Distortions of reality are common. Even the healthiest among us create stories designed to

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explain a puzzle in our lives or to help us through trauma. These stories are narratives that provide new truths by denying particular elements of reality. They represent the mind's method of filling in gaps, providing justifications for what we can't explain or wish to explain in a different way. This is an adaptive feature of the human mind, one that is uniquely human. But this same feature can be used to justify immoral and atrocious behaviors, the kind that lead to excessive harms. When we distort reality by treating others as non-human, perceiving and judging them as animals, parasites, or machines, we have armed ourselves with a weapon that enables great harms by removing the moral consequences of our actions. Animals, parasites and machines are outside of our moral concerns, so we shouldn't feel guilty, or wrack our conscience when we end their lives or ability to move. Animals, parasites and machines don't have rights, and thus, we have no obligation to them. Similarly, when we distort reality by means of deception and self-deception, we have armed ourselves with weapons that enable desire to run wild. Self-deception generates overconfidence. Overconfidence enables us to pursue our desire for power, freed from the reins that pull us back, away from costly interactions. Self-deception allow us to convince ourselves and deceive others that we are under attack, threatened by those who are unlike us. Under the circumstances, we are justified in using self-defense, even if this leads to annihilating the enemy. Often, self-deception combines with dehumanization to maximize the effectiveness of the distortion, paving an unobstructed path for runaway desire. Denial enables desire to achieve satisfaction, minus the moral conscience. These are the ideas that I will explore in this chapter.

Before discussing the scientific evidence that explains how the brain distorts reality by dehumanizing and self-deceiving — two core elements of denial — we must understand how the brain creates the reality of humanization, a process that imbues some things but not others with human qualities and moral worth. This is an important problem as it shapes our perception of evil, who can cause excessive harm and who can suffer from it. Rocks can cause great pain — as in landslides — but we don't hold them responsible for the harm caused because they lack intentions, beliefs, goals, and desires. Rocks can also be crushed, pulverized into sand by humans working in a quarry. But rocks are neither innocent nor victims as they have no moral worth, no capacity to suffer, and no ability to intentionally harm another. If not rocks, what?

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Earthquakes, viruses, chimpanzees, children, and psychopaths can all cause harm to others, including humans and other animals. We might be tempted to think that only psychopaths are rightfully classified as evildoers because they are the only ones that can cause excessive harm to innocent others with harm as a goal. But this begs the question of what we mean by excessive, innocent, and goal.

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Earthquakes, viruses, chimpanzees, and some children often cause excessive harm to innocent others, at least if the focus is on numbers and the way in which death arises. The earthquake that reached a magnitude of 7.0 on the Richter scale and demolished the capital of Haiti in 2010 took the lives of approximately 200,000 people, all innocent and undeserving of this natural disaster. This is excess beyond what any psychopath has ever achieved. The Spanish Flu found its way into the bodies of innocent people from the Arctic to the Pacific Islands from 1918 to 1920, and killed over 50 million people — a death toll that is at least four times higher than what Hitler caused during his reign, and comparable to that achieved by Mao Ze-Dong during his. As noted in chapter 1, chimpanzees kill at a rate that approximates many hunter-gatherer groups. When they kill, the frenzied attacks are over the top, involving gruesome dismemberment of their victims by biting into the face, ripping off testicles and dislocating limbs. By the age of 15 years, Willie James Bosket Jr had committed some 200 armed robberies, stabbed 25 innocent victims, kicked a boy off of a roof to his death, and killed two men following a failed robbery, all "for the experience." At the level of outcomes, these are all horrific cases of lives lost, with some excessive in terms of numbers and others in terms of means.

We can eliminate earthquakes and other natural disasters from the list of evildoers by noting that they don't have, as their goal or as a foreseen consequence, the elimination of lives, innocent or not. They don't have goals at all. This also eliminates them from the class of victims, assuming the day comes when scientists can kill off earthquakes, cyclones, hurricanes, blizzards and so on before they pick up enough steam to cause great harm. One might think that viruses, and their virulent partners the parasites, lack goals because they lack brains. This intuition is correct anatomically, but incorrect conceptually. As the American philosopher Daniel Dennett has noted, the beauty of Darwin's theory of natural selection is that it provided a way of giving nature competence without comprehension. Thus, viruses and parasites have goals without understanding at all. To survive and reproduce, they have evolved exquisite chemical and electrical machines that harvest all of their host's resources. And if making a living requires killing the host, so be it. They do so without shedding a tear. No guilt, no remorse. Chimpanzees, on the other hand, have goals and brains that represent them. When chimpanzees kill, their goal is not food. Their brutal attacks are motivated by a desire to outcompete their rivals and absorb additional resources; no one knows if they feel guilt or remorse. Willie Bosket's goal was to rob two men, but when he failed, he turned to gratuitous violence, *for* the experience. Bosket certainly could, as a human, feel guilt and remorse, but all reports indicate he didn't.

We can eliminate parasites and viruses from the list of evildoers and evilreceivers by noting that they lack an understanding of right and wrong, and are incapable of suffering. Chimpanzees are a harder case. They live in societies with norms and respond aggressively to norm transgressions, as occurs when a high ranking male beats a lower ranking male for trying to steal food or a mating opportunity.

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Chimpanzees also suffer, experiencing pain from both physical attacks and social loss. But getting angry at something or someone and feeling pain from a physical or social assault are different from getting angry because someone's behavior was morally wrong, and suffering from a morally toxic action. I get angry at my computer all the time, swearing when it crashes, and even smacking it on its backside. But there is no moral harm. In this sense, there is no evidence that chimpanzees have a sense of right and wrong, and that the pain they experience is linked to a sense of how one ought to behave. Chimpanzees can't be evildoers, but they certainly can, and have been evilrecipients.

There is also an important difference between violently harming another and knowing it is wrong, and harming another because it is wrong. The latter fits at least one view of evil, a kind of radical evil in which harm is created for harm's sake, because it is rewarding. When Willie Bosket killed those two men, he was certainly old enough to know the difference between right and wrong. He most likely killed knowingly, perhaps for the generic experience of shooting someone, but perhaps not with a desire to harm for harm's sake. Then again, when he noted that he killed for the experience, perhaps this was the experience of pleasure from harming another.

Was Willie Bosket responsible for his shootings? The answer to this question depends on how we think about Bosket's options, and the link between cause and effect. At the simplest level, Bosket caused the death of the two men in the same way that a swinging wrecking ball can cause the death of two men. But the wrecking ball can't be held accountable or responsible in the same way that Bosket can. Wrecking balls lack options and lack the capacity to predict the consequences of their actions. Bosket had options, could foresee the consequences of his actions, and had the capacity to act upon his options. Or did he?

We know that the frontal lobes of the brain play an important role in self-control and emotional regulation. We also know that this area of the brain is not fully mature until people reach their mid-twenties. Bosket was, therefore, operating with an immature brain. His actions were, in some ways, like the wrecking ball, driven by inertia. Perhaps the frustration of failing to achieve his goal — robbery — caused a dizzying chemical reaction in his brain, causing a flood of emotions, blinding his capacity to think rationally. Paraphrasing the Slovenian philosopher Slavoj Zizek, these electrochemical storms in Bosket's brain caused him to *deposit his conscience* at the door. Like the husband who finds his wife in bed with her lover and kills them both on the spot, Bosket committed a crime of passion. On this account, not only is he not evil, he is pardonable.

Immaturity is a mitigating factor when we evaluate a crime. It is why, in many countries, there is one legal system for youths and another for adults. It is why, in countries with the death penalty, such as the United States, youths are immune. With maturity comes a heightened capacity to control ones actions, or at least, to gain better self-control and thus, to take responsibility for what one does. This

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means that maturation eventually legitimizes individuals as potential evildoers. It does not, however, cause a shift in our sense of evilrecipients. Willie Bosket may not have been an evildoer, but he certainly could have been an evilrecipient.

What about psychopaths, people like Charles Manson and Ted Bundy? Pop culture tells us that they are depraved, heinous, immoral monsters, deliberately causing harm to others, and often with a delicious twinkle in their eye. But what if I told you that several recent studies of psychopaths indicate that they know the difference between right and wrong? When judging the moral permissibility of different actions, such as harming one person to save the lives of many, psychopaths' judgments are often like yours and mine, nuanced, varying depending upon the outcomes and the means by which they are achieved. This is a rational, albeit largely unconscious understanding of right and wrong. This makes psychopaths nothing like earthquakes, viruses, chimpanzees, or young children. It also means that they don't have bad moral principles, but rather, ones that are like yours and mine. What if I further told you that before they develop into fully licensed-to-kill or extort psychopaths, many have an early history of torturing pets and bullying other kids. What if I further told you that when they cooked the cat in the microwave or bloodied little Johnny's face with their fist, that the consequences of their actions left them cold — no guilt, remorse, or shame. Nothing. And what if I told you that these people are born with a different brain chemistry and structure than you or I, leading to poor self-control and an emotionally callous view of the world? If this medical report is correct, and I believe the scientific evidence supports it, then psychopaths lack the ability to see alternative options and act on them. They also lack the resources for self-control. Given this evidence, psychopaths are not evil at all, though the consequences of their actions are often excessively heinous. Given this evidence, not one member of our initial list would count as evildoers, though chimpanzees, children and psychopaths would all count as potential evilrecipients.

What this discussion highlights is that our perception of evildoers and evilrecipients is influenced by our sense of what it means to be human. Though evildoers and evilreceivers overlap in their capacities to think and feel, there are differences, captured by Aristotle's distinction between moral agents — those who have responsibility for others well being —and moral patients — those who deserve moral consideration and care from moral agents. The distinction gains scientific credibility thanks to a set of studies by the American psychologists Kurt Gray and Daniel Wegner. In one experiment, a large internet population compared the qualities of different things, including humans at different stages of development — fetus, baby, child, and adult — an adult human in a vegetative state, a dead human, nonhuman animals — frog, pet dog, chimpanzee — God, and a socially savvy robot. Subjects judged different pairings of these *things* on a wide range of dimensions, including which was more likely to develop a unique personality, feel embarrassed, suffer pain, distinguish right from wrong, experience

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conscious awareness, exert greater self-control, plan ahead, develop fears, feel pleasure, and erupt into rage. Subjects also provided their personal opinions on which individual, within the pair, they liked most, wanted to make happy or destroy, was most deserving of punishment, and most likely had a soul.

I assume that everyone reading about the design of this study has already formed an opinion about some of the comparisons. Presumably everyone believes that a living adult is more consciously aware than a dead person, fetus, dog, and robot. Presumably everyone believes that all animals feel more pain than a dead human or a robot. And presumably everyone would rather make a dog happy than a frog, and would be more likely to allocate souls to fetuses, babies, and adult humans than to robots and frogs. But are we more conscious than God? Does a chimpanzee feel more embarrassed than a baby? Can a person in a vegetative state feel more pleasure than a frog or robot? What dimensions, if any, cause us to lasso some things together but not others? What things cluster together and why? As a reminder: this study is about our intuitions, not about what scientists have discovered about the minds and emotions of these different things.

Adding up the large set of responses produced a map or landscape defined by two dimensions: experience and agency. Experience included properties such as hunger, fear, pain, pleasure, rage, desire, consciousness, pride, embarrassment, and joy. Agency included self-control, morality, memory, emotion recognition, planning, communication and thinking. Experience aligned with feelings, agency with thinking. With these dimensions, we find God at one edge, high in agency and low in experience. On the opposite side, huddled together on the landscape, defined by low agency and high experience, we find fetuses, frogs, and people in a vegetative state. High in both agency and experience were adult men and women. Robots and dead people were low on experience and in the middle for agency, whereas dogs, chimpanzees, and human kids were high on experience and middling on agency. This landscape not only helps us understand how people classify these different entities, but also plays a more active role in guiding individuals' judgments to punish, provide pleasure, and avoid harm. If you have to harm something, pick an entity low in experience, such as dead people and robots who can't suffer. If you have to punish something, pick an entity high in agency, such as living adults who recognize the difference between right and wrong and have the capacity for self-control.

What this work shows is that people have strong intuitions about which things are morally responsible as agents and which are deserving of our moral concerns as patients. Moral patients are high in experience, and can thus suffer as victims, innocent or not. This is why many countries have created laws against harming nonhuman animals, including restrictions on which animals can serve in laboratory experiments, what can be done to them, and how they should be housed. This is also why we don't do experiments on fetuses, newborns, adults in a vegetative state, or humans with neurological disorders that knock out aspects of their experience and agency. Once something enters the arena of moral patients, we

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tend to leave them within this arena even if they lose particular capacities. Conversely, if scientists discover that an organism outside the arena of moral patient-hood has capacities of experience and agency that are on a par with those inside the arena, this evidence often promotes their legal status and protection. Such was the fate of the octopus, an invertebrate once classified by Aristotle as "stupid", but now elevated to the company of much smarter animals that solve novel problems, deploy trickery, and show some evidence of being aware of their behavior. As such, they are one of the few invertebrates to enjoy heightened protection and care when they are kept in captivity.

Moral agents are high in agency, meaning that they can distinguish right from wrong, exert self-control in the context of selfish temptation, can be blamed and punished, and are expected to care for moral patients. Moral patients are high in experience, including especially the capacity to feel pain. Both moral agents and patients have moral worth. But as in all entities that have worth or value, some are more valuable than others. So it is with moral worth. This is where departures from humanness get interesting, dangerously so. When we strip individuals of their moral worth, denying them qualities that define humanness, we have entered a world of distortion and denial that facilitates and justifies excessive harms.

Across many studies, individuals consider themselves to be more human — as defined by the dimensions of experience and agency — and to have greater moral worth than other individuals. When individuals are socially ostracized and excluded from a group, they judge themselves as less human, and so do the spectators who observe the ostracism. Individuals judge members of their own group to be more human and morally worthy than those outside the group, no matter how small or broad the group is. What counts is our overall sense of how we compare to others, and the dimensions used to calibrate this similarity metric. The Australian social psychologist Nick Haslam carried out several experiments to determine how our rating of a group's humanness influenced how much we praise, blame and protect them, as well as whether we believe that rehabilitation or punishment is most appropriate after they have done something wrong. Haslam based his study on the idea, supported by the law, science, and our folk intuitions that we blame, praise and punish only those who do bad things on purpose as opposed to by accident. Conversely, we favor rehabilitation in those cases where we believe that the person can right a wrong, learning a lesson from a prior transgression.

Subjects started by rating several different social groups along different dimensions of humanness. Though Haslam's dimensions were slightly different from those used by Gray and Wegner, they generally corresponded to experience and agency, including compassion, warmth and a sense of community on the one hand, and reason, self-control, civility, and refinement on the other. The target social groups were associated with negative or positive stereotypes such as the homeless, mentally disabled, athletes, politicians, doctors, lawyers, gays, and different religious groups. Next subjects imagined that a member of one of these groups had acted morally or immorally, or had been mistreated in

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some way. Then they decided whether the person should be praised for a particular moral act such as returning a wallet, considered responsible for an immoral act such as breaking a promise, helped out for mistreatment such as being pushed out of line by a person in a hurry, and punished or rehabilitated for wrongful behavior.

Haslam's results generated a landscape of humanness very much like Gray and Wegner's. Those groups rated highly in terms of agency, were more likely to be blamed and punished. Those groups rated high in experience were more likely to be praised, protected, and placed into rehabilitation. Those groups perceived as more emotional, compassionate and warm — components of experience — were praised more, whereas those perceived as more civil and rational — components of agency — were praised less. Overall, the more a group tilts toward the experience end of the spectrum, the more we see them as moral patients, deserving of our care and compassion. The more a group tilts toward the agency end of the spectrum, the more we see them as moral agents, having responsibilities and duties to act morally.

Haslam's findings are not only of great conceptual interest, shaping our understanding of the defining qualities of being human, but also figure into everyday political and legal decision making. When do we believe a person has the right to vote, drive responsibly, drink alcohol reasonably, and serve an adult as opposed to a youth sentence for a crime? In the United States, the age cut off for considering the punishment of a crime under the jurisdiction of a juvenile court proceeding ranges from 16-19 years. Juvenile sentences are lighter than adult sentences, and rarely include life in prison or the death penalty. Though there is an arbitrariness to these age cut offs, and no good reason why states should differ, the decision to treat youths differently not only maps on to our intuitions but to the attributes that psychologists such as Haslam, Gray and Wegner have discovered. Treating an individual as a youth is more likely to trigger the dimension of experience in jury members and thus, more likely to trigger a sense that the individual should be protected and given the opportunity to change through rehabilitation. This fits with scientific evidence that an immature brain is a more plastic brain, capable of change. It also fits with the evidence that an immature brain is a brain with less self-control and critical reasoning — both components of the agency dimension. These less than fully human qualities on the agency dimension, balanced by more qualities on the experience dimension, provide youths with an automatic entry ticket into the arena of moral patients.

Moving outside of the arena of moral patienthood and into that of moral agency requires a change in perception. It requires us to see individuals as acting responsibly, controlling temptation, and understanding the distinction between right and wrong. It is for these reasons that our legal system, and the courts that carry out its principles, must consider psychological differences. Classifying individuals as adults or juveniles drags with it a massive psychology that is biased toward responsibility, blame and punishment on the one hand and protection, intervention, and rehabilitation on the other. The same biases

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are also engaged when we consider adults with developmental disorders or brain injury, as these deficits are often associated with selective loss of either components of agency or experience, and sometimes both. As demonstrated by the work of Kurt Gray, Andres Martinez, and others, labeling someone a psychopath, autistic, or schizophrenic effectively pigeon holes the individual into a class of individuals with less than fully human qualities. This is a good thing when it focuses us on protection, intervention and rehabilitation. It is a bad thing when it allows us to morally disengage because those lacking the full compliment of qualities associated with agency and experience are less morally worthy. Humanness drives our moral concerns and our sense of others' moral worth. When we lower our sense of another's value, we are willing to violate our sense of the sacred, engaging in trade-offs that are normally taboo.

Experiments by the American psychologists Philip Tetlock and Jonathan Haidt help us see what is sacred by asking individuals what they would pay to do something sacrilegious. If something is sacred, of great moral worth either personally or to your group, could you be paid off by a wealthy investor to give up the object or engage in an act against it? For each of the acts below, think about your payoff point in dollars from $0 (for free) to $1million, including the option of saying that you would never do it for any amount of money. Keep in mind that if you choose to carry out an act and receive payment you will not suffer any consequences:

- Kick a dog in the head, hard.
- Sign a secret but binding pledge to hire only people of your race into your company
- Burn your country's flag in private
- Throw a rotten tomato at a political leader that you dislike.
- Get a one pint transfusion of disease-free, compatible blood from a convicted child molester.

If you are like the subjects in these experiments, the mere process of considering a payoff, even for a short period of time, will have turned your stomach into knots and triggered a deep sense of disgust. This is because violating the sacred is akin to violating our sense of humanness. It is playing with the devil, accepting a Faustian offer of money to strip something of its moral worth. As Haidt notes, even though it is sacrilege to accept payment across different moral concerns, including avoiding harm, acting fairly, and respecting authority, different experiences can modulate the aversion we feel when we imagine such transgressions. Women typically demand more money for each of these acts than men, and more often reject them as taboo. Those who lean toward the conservative end of the political spectrum either ask for more money or consider the act taboo when compared to liberals, and this was especially the case for questions focused on acting against an in-group (race), an authority figure (political leader), or ones purity (blood transfusion). What this shows is that our cultural experiences can distort what we consider

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morally worthy or sacred. It shows how easily we can flip our values in the face of tempting alternatives.

The scientific evidence presented in this section shows that our decisions to treat others according to different moral principles or norms is powerfully affected by our sense of what counts as another human being. What counts includes at least two important dimensions, one focused on agency and the other on experience. These dimensions determine whether we blame or praise someone, punish or rehabilitate them, and ultimately, include or exclude them from the inner circles of moral agents or moral patients. Those who fall outside these two inner circles are morally worthless. Those who are morally worthless can be destroyed or banished. Some things are justifiably excluded and fit with our general sense of reality — rocks, dirt, cardboard boxes, plastic balls, and pieces of glass. Other things are excluded because they don't fit with our values of what reality should be. This is where distortion and denial enter the process. This is where we create walls around members of one group in order to keep others out. This is where we express partiality instead of the impartiality that Lady Justice champions with her two balanced scales and blind fold-covered eyes. This is where we exclude others from our inner sanctum in order to justify great harms. How is the inner sanctum set up and put into action over a lifetime, sometimes for legitimate causes and sometimes for illegitimate and unconscionable causes?

Populating the inner sanctum

Elie Wiesel, the Nobel Peace Laureate and Holocaust survivor, remarked that "anti-Semitism is the most ancient form of prejudice." This claim may well be true of human written history, but is most definitely false if one considers the fact that all social animals and human societies, including the hunter-gatherer groups that are descendants of people that predated the Jews, hate some individuals and love others. Prejudice, though often based on deep seated ideological biases and stereotypes that humans invent, is, at root, a form of partiality. Every social animal, either extinct or alive today, expresses partiality. This is a highly adaptive and ancient psychology, promoting the care of young, investment in mates, and escape strategies against enemies. Humans are no different, except for the role that our promiscuous brains play in fueling partiality with ideology and symbolism. Sometimes when we express our partiality it is for the noble cause of caring for our children and for defending ideological beliefs surrounding humanitarian causes, including defense of basic human rights. Sometimes when we express our partiality, it is for the ignoble cause of destroying others. How does human partiality begin? Do babies express preferences for certain social categories? How does their experience sculpt new categories? How is the inner sanctum populated, enabling us to preferentially help those within and harm those outside?

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At birth, newborns preferentially listen to their native language over a non-native language. Soon thereafter, infants prefer to listen to their native dialect over a non-native dialect, and look longer at their own race than another race. This shows that they can discriminate between different languages, dialects, and racial groups. But do they form social preferences based on these distinctions? Would a young baby or child prefer to take a toy from an unfamiliar person who speaks the same or different language, from the same or different race? To answer these questions, the American psychologist Katharine Kinzler put 5 months old babies to a test.

Babies born into mono-racial and mono-lingual families sat on their mother's lap in front of two monitors, each presenting short video clips of different people. After watching the videos, Kinzler created a bit of magic. The people in the monitor appeared to emerge from the 2D image and offer the baby a toy. The trick: a real person, hidden beneath the monitor, synchronized her reach with the reach in the monitor. Who would the baby choose given that both people offered the same toy? Babies preferred people speaking the native over non-native language, and native-accent over the non-native accent. At this young age, however, they showed no preference for native over non-native race. Thus, early in life the connection between discrimination and social preference is well established for language, but not race. When do things change for race?

Kinzler carried out another series of experiments on race with one group of 2.5 year old children and a second group of 5-year olds. Though the methods were somewhat different, they both focused on the child's preferences, including who they would share toys with and who they would prefer as friends. The 2.5 year olds showed no preferences, whereas the 5 year olds preferred their own race. Race is therefore a slowly developing category, at least in terms of its impact on social preferences, and especially when contrasted with both language and accent.

Kinzler took these studies one step further to explore whether there is anything like a hierarchy among these social categories and the features that define them. What's more important to a young child building an inner sanctum of trusted others —race, language, or dialect? Would they rather interact with someone of the same race who speaks a foreign language or someone of a different race who speaks the native language? Using similar procedures, Kinzler showed that by 4-5 years of age, language trumps race. Children would rather interact with someone from a different race speaking the same language than someone of the same race speaking a foreign language.

Why would language trump race? Kinzler's answer relies on an idea developed by the American evolutionary psychologist Robert Kurzban. Imagine a hunter-gatherer in South Africa, living during the earliest stages of our evolutionary history. As individuals searched for food to eat, areas to sleep, water to drink, and places to avoid, they came across other individuals. These individuals were always members of the same race. Racial differences did not emerge until relatively late in human evolution, well after our

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ancestors took their first steps out of Africa. If we are thinking about an evolved psychology for bonding with members of our own group and fighting those outside, our ancestors would have been blind to race as it was not yet an emergent property of our species. Language was, however, a property of our species, and one that varied across populations. A hunter-gatherer walking the plains of South Africa would indeed have run into people speaking either a completely different language, or the same language with a different dialect. New languages are not easily acquired, and nor are new dialects. It takes real talent to speak a new language or dialect without a trace of ones origins. Thus, like the stotting gazelles, magnanimous spenders, and healthy evildoers discussed in chapter 2, the native languages and dialects we speak are honest signals of social group membership. Honesty is supported by the costs we pay to acquire them. Cheating is hard because there is a start-up cost associated with perfecting the natural rhythm of a second language or novel dialect.

The babies in Kinzler's experiments tell us something important: race and language are both important social categories and discriminable from an early age. But language trumps race as a feature because it is a better predictor of membership within the inner sanctum, at least early in life. Ultimately, both language and race allow us to close off some from the inner sanctum and allow others in. Ultimately, our allegiance to our native language and race can fuel our hatred toward those who look different and speak in different tongues.

Closed doors

As adults, we tend to rely on rules of thumb to guide our social interactions, including who we trust and who we distrust. We tend to trust those we know more than those we don't know. Within the circle of those we know, we believe those who are more like us than those who are unlike us, using fixed body features — race, height, hair color — flexible psychological features — food preferences, sports' interests, religious beliefs — and features that are flexibly constrained — language and intelligence. Together, these different dimensions cause us to close the door on some and open it to others.

Language is particularly interesting. If you can't understand someone because they don't speak your language or because their accent is too heavy, then the issue is not trust, but comprehension. But what if you can understand the person perfectly well, but they speak with a foreign accent, either one from a different country (e.g., a French speaker speaking English) or one from the same country but a different region (e.g., a Southern accent in the northeast of the United States)?

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Subjects in an experiment first listened to people reading trivia, such as "A giraffe can go without water longer than a camel can," and then judged whether the sentence was true or false. If the sentence was read in a foreign accent, subjects were more likely to say that it was false than if it was read in the native accent. Subjects voiced this opinion even though the experimenter told them that the reader was not expressing an opinion, but merely reading the passage as instructed. In a second experiment, British subjects listening to a non-guilty plea by a person on trial were more likely to judge the person as guilty if he committed a blue collar crime and spoke with a non-standard British accent (e.g., Australian). In contrast, they were more likely to judge a white collar criminal as guilty if he spoke with a standard British accent. Even within the class of British accents, biases emerged: subjects from the Worcester region were more likely to judge supposed criminals as guilty if they spoke with a Birmingham accent than with a Worcester accent. Together, these studies paint a bleak picture: accents from an out-group are perceived as less truthful than others, and in the context of a criminal case, more guilty as well.

Accents are learned early in life, and once in place, are both clear markers of your origins and difficult to undue. As such, they are honest indicators of at least one dimension of group membership. What about dimensions that can readily be acquired at any point in life, and just as easily dropped? How do these influence not only our perception of those who share these dimensions in common, but how we treat them? In the last chapter I discussed a study by Tania Singer in which both men and women showed more pain empathy — as revealed by activation in the insula region of the brain — when they watched a cooperator experiencing pain. Further, men showed a reduction of activity in this area when a cheater experienced pain, and increased activity in a reward area — the nucleus accumbens. This pattern fits well with the research on human and nonhuman animals showing that winning, and watching winners win, triggers a choreographed ballet of physiological responses associated with reward. Singer took this work further, asking whether an individual's support for a sport's team might similarly modulate both the feeling of pain empathy as well as reward. Subjects, all soccer fanatics, sat in a scanner and watched as a player from their favorite team or a rival experienced pain. Next, Singer provided subjects with three options for interacting with these players: help them by personally taking on some of the pain they would receive, letting them take on all the pain but watch a video as distraction, or let them take on all the pain and watch as it happens. Option one is costly altruism, two is blissful ignorance, and three is schadenfreude.

In parallel with the earlier work on fairness, here too Singer observed greater pain empathy when the favorite team player experienced pain than when the rival experienced pain. She also observed that subjects were more likely to help favorite team players by taking on some of their pain, but more likely to watch rivals receive pain. The higher the activation level in the insula, the more they took on their favorite team player's pain session — the more they helped. When they watched rivals experience pain,

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there was significant activation in the nucleus accumbens. They felt an immediate honey hit, joy over the rival's pain. The higher the activation in this reward area, the more likely they were to choose the option of watching the rival experience pain — like watching a public execution and cheering for just deserts. These results show that individual differences in our compassion toward others in pain predicts our willingness to help them. It reveals another dimension, like language, that biases our sense of justice, both in our judgments and in our behavior. Conversely, individual differences in our joy over others' misery predicts our willingness to allow others to suffer, suppress our instincts to help and, I suggest, facilitate our capacity to harm. Similar response patterns arise in the context of race — a feature of group membership that is fixed at birth.

As noted earlier, babies stare longer at faces of people from the same race than from people of a different race, and by the pre-school years, are more likely to show social preferences for peers and adults of the same race. In brain imaging studies, specific areas activate when we process faces as opposed to other objects, and one tenth of a second later, other associated regions activate when we process race. This rapid activation occurs whether we are consciously engaged in classifying faces by race or not; for example, the same areas activate even when we are forced to focus on gender or familiarity. This shows that from the brain's perspective, we don't have an option of processing a person's race. The brain automatically and unconsciously hands us this information, like it or not.

The fact that we process race automatically gains importance based on a powerful set of behavioral studies showing that virtually every person, independently of their explicit avowals of non-racist attitudes, holds implicit or unconscious racist biases. Using a research tool developed by the social psychologists Tony Greenwald and Mahzarin Banaji called the *Implicit Attitudes Test* or IAT, subjects see different faces or read different descriptions of people, and then make evaluative judgments about these people. Often, the presentations are rapid so that there is little or no time to reflect upon the evaluation. For example, in a study focused on race, subjects first classified photographs of people's faces as either Caucasian or Black. Next they classified words into those associated with good positive meaning — joy and friend — and those with bad negative meaning — hate and bomb. In the third and critical step, subjects saw faces and words together and, using a rule provided by the experimenter, struck one of two keys on a keyboard as fast as possible: for example, strike the #1 key if you see a Black face and a good word, but the #2 key if you see a Caucasian face and a good word. The intuition here is that if certain faces and words are more strongly associated, because this is what people have learned over time, then they will press the relevant key faster than for weaker associations. Results from several studies confirm this intuition. For example, Caucasian subjects who explicitly deny racist attitudes are nonetheless slower to respond when Black, as opposed to Caucasian faces are associated with good words, and faster to respond when Black, as opposed to Caucasian faces are associated with bad words. These patterns hold

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even when subjects respond to names commonly associated with Caucasian and Black people. A quick skim through the many blogs commenting on this work reveals a common refrain that makes the key point: many that have taken this test, whether focusing on race, sexual orientation, or political affiliation, opine that the test must be invalid because they explicitly disavow any groupish biases. But that's the point! What we disavow explicitly has less impact than we would like on what we hold implicitly.

If our implicit system champions one view of racism and our explicit system another, then we are continuously faced with an epic conflict. To resolve this conflict, and enable the explicit system to emerge triumphant, requires self-control, keeping the implicit system quiet. Studies of the brain provide interesting insights into this process. Recall that when we experience conflict, regardless of its content, there is activation in the anterior cingulate. When we exert self-control, regardless of content, there is activation in particular regions within the prefrontal cortex. When we feel threatened by a dangerous animal or person, there is activation in the amygdala. These three brain regions tell an interesting story about how we process race. When Caucasian subjects view faces of Black as opposed to Caucasian people staring at them, there is greater activation in the amygdala. This racial difference disappears if subjects view photos of faces looking away or with eyes closed. It is the potentially threatening aspect of a face staring at you that engages the racial difference. If you briefly flash faces at Caucasian subjects so that they are unaware of them, there is stronger activation in the amygdala for Black than Caucasian faces. But if you present the faces for long enough, allowing them to enter conscious awareness, the amygdala's pattern of activity goes away, replaced instead by strong activation in the anterior cingulate and prefrontal cortex. Staring longer at someone from a different race triggers a sense of conflict and engages the system of self-control, pushing down our implicit racism to enable more explicit neutrality and equality.

What this work shows is that understanding our attitudes and actions toward those of the same and different race requires consideration of implicit and explicit components. Think of this process like a hand pushing down on an automatic watering fountain. The machinery that produces the pressure to push water out of the holes in the fountain operates without concern for what happens outside in the world. The hand that pushes down is under human control, consciously guided, perhaps with the aim of simply spreading the water or feeling its' coolness on a hot day. Though the hand may try to control the movement of the water, it may only do so to some extent, guided by the power of the automatic engine below. Thus, we have an automatic bottom up mechanism and a controlled top down mechanism. So it is with race. The bottom up mechanism operates automatically, pushing forward our implicit prejudice. The top down mechanism attempts to exert control, when and where it can, to avoid looking racist, sexist, or what have you. Somewhere, the two meet, creating a personality profile that is more explicitly racist,

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sexist, or X-ist in some cases than others, either because the individual lacks top down control or because they decide to relinquish it.

In parallel with Singer's work on the relationship between pain empathy and our classification of others as fair-minded cooperators or narcissistically-minded cheaters, so too does race influence our expression of compassion toward those in pain. Both Caucasian, Black and Asian subjects showed stronger activation in the pain-related areas of the brain when viewing individuals from the same race experience pain than when viewing individuals of a different race. When Black subjects played a computerized game involving social ostracism, they showed stronger activation in areas of the brain involved in social pain when excluded by Caucasian players than when excluded by Black players. When others suffer and we have the opportunity to help them, we are more likely to help those of the same race, and feel good about it as evidenced by activation of brain areas involved in reward.

Our biases, both implicit and explicit, influence our compassion toward others and our motivation to help. This statement is true whether we are looking at evidence from young children or adults, and using measures that assess sensory perception, behavioral judgment, or activity patterns in the brain. Beginning with an evolutionarily ancient brain system that was designed to distinguish friendly ingroup members and antagonistic outgroup members, we populate the inner sanctum with people who we perceive as most like us, using both fixed and variable features. With time, the walls surrounding this sanctum close, attributing the full richness of human nature to those within, and bleaching it from those outside.

Bleaching humanity

Draw an imaginary circle around yourself with a diameter of about fifty feet. Now imagine packing this circle with people, forming an expanding set of concentric circles that radiates out from those closest to you to those you don't know at all. Based on social network analyses by sociologists such as Nicholas Christakis, the majority of people within the inner circles will be like you in a number of ways, including their race, religion, political affiliation, food preferences, and aesthetics. This includes family members and close friends, but also those we work with, vote for, and play with. As you travel from the inner core to the outside, you will find less in common. Some in the outer core will not only have less in common, but as noted earlier in this chapter based on work by Gray, Wegner and Haslam, will be perceived as less human, stripped of dimensions of experience and agency that define humanity. Some will appear like objects, others like animals. When we transform others into objects, we have stripped away core aspects

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of human nature, including emotional sensitivity, warmth, and flexibility. When we transform others into animals, we have stripped them of uniquely human qualities such as rationality, self-control, moral sensibility, and civility. Of those who are like animals, some will seem like kin to the domesticated form and thus controllable as property; others will seem like wild animals and thus dangerous, dirty and deserving of elimination. However we engage this process, we have bleached individuals of their humanity. This process, one that occurs in both everyday life and in cases of conflict, has allowed us to treat the mentally and physically disabled like animals, to consider women as sexual property, justify slavery and slave wages, deny certain races the opportunity to vote and receive education, and mandate ethnic cleansing.

Before I describe a shocking set of experimental findings on dehumanization, consider first a snapshot into some of our historical attitudes, shared across many countries and cultures. Before we knew much about human evolution and the causes of variation, scientists made sweeping statements about the relationship between brain structure and differences in intelligence and behavior among men, women and the variety of races. It was commonly believed that, compared with white men, women and all other races had smaller brains, approximating our cousins the apes. Listen to Gustave LeBon, a distinguished social psychologist, writing in 1879:

> In the most intelligent races, as among the Parisians, there are a large number of women whose brains are closer in size to those of gorillas than to the most developed male brains. This inferiority is so obvious that no one can contest it for a moment; only its degree is worth discussion. All psychologists who have studied the intelligence of women, as well as poets and novelists, recognize today that they represent the most inferior forms of human evolution and that they are closer to children and savages than to an adult, civilized man. They excel in fickleness, inconstancy, absence of thought and logic, and incapacity to reason. Without doubt there exist some distinguished women, very superior to the average man, but they are as exceptional as the birth of any monstrosity, as, for example, of a gorilla with two heads; consequently, we may neglect them entirely.

By elevating white men to the gold standard of perfection, it was easy to see everyone else as a degenerate form of God's creation or, in biological terms, of arrested evolution, with non-Caucasian races showing greater affinity to our furry cousins the apes. Looked at today, backed by our understanding of genetics and the evolutionary process, these accounts are absurd and offensive. Sadly, despite efforts to clean up our explicit racist and sexist attitudes, overwhelming evidence reveals that the brain holds dear a suite of unconscious prejudices that serve to dehumanize those unlike us.

Now the shocking experiments. The American social psychologist Jennifer Eberhardt dared to ask whether US citizens unconsciously associate Black people with imagery ofd apes, using the disturbing history of this association as her jumping off point. In parallel with the studies of race

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presented in the last section, Eberhardt was also interested in the possibility that if people carry this association around in their head, they do so unconsciously, despite explicit avowals that they are not at all racist. And if they carry this association around unconsciously, how does it impact upon their judgments and actions?

In one experiment with both Caucasian and non-Caucasian subjects, Eberhardt used a technique called subliminal priming. Subliminal priming involves rapidly presenting pictures, sounds or other experiences under the radar of awareness and then presenting material that falls within our radar. If the two experiences are similar, the unconscious version affects subjects' perception of the conscious one. For example, if you first prime people by flashing the picture of a woman's face, subjects then respond faster to faces of women than to faces of men. In other words, despite the fact that subjects are unaware of the prime, it affects their judgments. Eberhardt first primed subjects with photographed faces of Caucasian or Black people or an unrecognizable non-face. They then watched a short movie that started off with an unrecognizable object that looked like it was covered by dense snow. As the movie progressed, the snow lifted, making it easier to recognize the object as a line drawing of either a duck, dolphin, alligator, squirrel or ape. Subjects stopped the movie as soon as they recognized the animal.

Compared with Caucasian faces and non-faces, priming with Black faces caused subjects to stop the movie much *sooner* for apes, but not for any other animal. Compared with non-faces, priming with Caucasian faces caused subjects to stop the movie much *later* for apes, but not for any other animal. This suggests that Black faces made it easier to identify apes, whereas Caucasian faces made it harder to identify apes, with no comparable effects for any other animals. Caucasian and non-Caucasian subjects showed the same pattern of response, and so too did individuals with and without strong, explicit racial attitudes. Although the similarity among Caucasian and non-Caucasian subjects is of interest, and suggests that the association is held even among those who were perhaps less strongly associated with this form of dehumanization, there were relatively few Black subjects in this non-Caucasian group. This first set of experiments suggests, therefore, that among a racially heterogeneous group of educated Stanford undergraduates, individuals carry an unconscious association between Black people and apes, and thus, an unconsciously dehumanized representation of another human being. Given the animal form of this dehumanization, the implication from Haslam's work is that Caucasians associate Blacks with less rationality, civility, and self-control, in essence, less uniquely human qualities.

These are remarkable and disturbing findings. They can't be explained by some superficial similarity between human faces and animals because Eberhardt found the same results when she presented either line drawings or words of animals. Had Eberhardt used actual photographs of animals, subjects could have used similarity in skin color or nose shape — for example, seeing a black human face would prime seeing a black ape face because both have the color black in common. Line drawings and

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written words cut the legs out of this account. Eberhardt's results suggest that apes are associated with the socio-cultural, racial category "Black."

These findings reveal a deep seated, dehumanized representation that is readily triggered even in highly educated people. But perhaps they are less disturbing then we might imagine. not so bad if the take home message is that we are closet racists with antiquated theories of evolution or God's design. Outside of these artificial studies, we are well educated citizens who keep our isms tucked away, locked up in our unconscious. Unfortunately, the unsettling feelings that many will have to these studies are exacerbated by an additional set of results collected by Eberhardt, linking unconscious impressions to harmful actions. Caucasian male subjects watched a video of a policeman using force to subdue a suspect who was either Black or Caucasian. When primed with an ape drawing, but not that of a tiger, subjects were more likely to say that the policeman was *justified* in subduing the Black suspect than the Caucasian suspect. We are more than closet racists. We are out of the closet, armed for prejudice and dehumanization.

To unconsciously think that Blacks are more like apes than other racial groups is to strip them of characteristics that are uniquely human. As Haslam notes, when we dehumanize others in this particular way, we no longer see them as human, but as incompetent wild animals or immature children lacking in intelligence, etiquette, rationality, and moral wherewithal. This mode of dehumanization is ancient, reflected in the writings and paintings of European explorers who encountered indigenous cultures in Asia, Australia, and Africa. Dehumanizing others into objects is equally ancient, unflattering and dangerous. In one study, American adults were told to focus on either the physical appearance or personality of the actress Angelina Jolie and the ex-governor of Alaska and presidential hopeful Sarah Palin — both famous personalities within the United States. When subjects focused on appearance as opposed to personality, they judged both Jolie and Palin as relatively lacking in traits of experience or human nature. Jolie and Palin were seen as objects. In other studies, carried out by Haslam, subjects judged objectified men and women as less capable of suffering and less deserving of moral compassion and protection, reinforcing the age old attitude we once held toward slaves, and that many hold today toward prostitutes. When people become property, they fall outside of the circle of moral patients. Studies of the brain provide further support for these dehumanizing transformations, and highlight, once again, both the beneficial and malignant consequences of our mind's promiscuity.

Brains without borders

Dehumanization enables doctors to treat their patients — human or nonhuman animal — as mechanical

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devices that require repair. This allows for cool-headed, rational, and skillful surgeries, while fending off the humanizing emotions of compassion and empathy. This is adaptive. This is a transformation that enables doctors working in war-torn areas or regions afflicted with a disease outbreak, to treat hundreds of suffering patients as if they were treating inert cars on an assembly line. Good doctors allow their compassion and empathy to return as their patients regain awareness. Bad doctors maintain their cool, detached manner, insensitive to the physical and psychological pain of their waking patients. Bad doctors continue to perceive their patients like cars on the assembly line. Really bad doctors see their patients like cars that were created for personal R&D.

Recall from earlier sections that when we see someone else in pain, particular areas of the brain activate as we imagine their suffering. Many of the same areas of the brain also activate when we personally experience pain. This is the circuitry for pain empathy. The French cognitive neuroscientist Jean Decety showed that when physicians look at video clips of people experiencing pain from a needle prick, this circuit is suppressed relative to non-physicians. For physicians, it's as if they were watching a needle prick a pillow. Though we don't know how much experience was necessary or sufficient to cause the physician's lack of pain empathy, or the extent to which physicians are physicians because they were born with less empathy, Decety's findings point to individual differences in our capacity to feel what others feel and the potential modulating role of experience.

Several studies now show that based on individual experience, the human brain readily flip-flops between empathy and callousness. In two similarly designed experiments, one recording from pain related areas in the brain, and the other from a motor area associated with the hand, Caucasian and Black subjects watched a video of a needle penetrating a human hand. Consistently, subjects showed weaker activation in the pain and motor areas when watching the needle penetrate the hand from another race. This lowering of pain empathy and motor response for the out-group was greatest for subjects with the highest implicit or unconscious racial biases, as measured with the IAT tool noted earlier.

These studies of the brain, like the behavioral studies I discussed earlier, add to the idea that we have a racial bias for pain empathy. We feel others' pain, but only for those who share the same race. But since, by definition, we look more like those from within our racial group than those outside it, perhaps the bias is less about race and more about those that don't look like us. To explore this possibility, Black and Caucasian subjects saw a needle penetrate a violet-colored hand. Violet hands are not only different, but far more different than either black or white hands in terms of our experience of skin coloration. Nonetheless, the activation pattern in the brain matched the subject's own race. When we feel less compassion for someone of another race, it is because of racial biases, not because of superficial differences in appearance. Color is simply a cue that reminds us of our prejudice.

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The fact that we feel less empathy for people in pain if they fall outside our inner sanctum suggests that we have dehumanized them, stripping away dimensions of experience that humanize those within the sanctum. These are the dimensions associated with emotion, and when taken away, cause us to perceive the other as an object. Since objects can't feel pain or joy, we can't share in their experience because they lack experience altogether. If that is the case, then when we perceive any human group that has been dehumanized in this particular way, there should be little to no activity in those areas of the brain associated with thinking, feeling, wanting, and believing. To explore this possibility, the social psychologist Susan Fiske placed subjects in a brain scanner and presented photographs of either extreme out-group members, such as the homeless and drug addicts, or photographs of other groups such as the elderly, middle-class Americans, and the rich. When viewing the extreme out-group, not only did Fiske see little activity in an area critically related to self-awareness and the process of thinking about others thoughts and emotions — the medial prefrontal cortex — but she also observed an intense increase of activity in the insula, a brain area that is recruited when we experience disgust.

Fiske's results highlight the dangers of dehumanization. Once we turn off areas of the brain that are involved in thinking about others' thoughts and emotions, and turn on areas involved in disgust, we have set ourselves up for moral disengagement. As the distinguished American psychologist Albert Bandura has documented through decades of research, moral disengagement allows people to justify harm by transforming lethal motives into morally justified and even benevolent ones. Moral disengagement allows us to excuse ourselves from moral responsibility, either disregarding the harm imposed or convincing ourselves that it was justified, even obligatory. In several international studies of school-aged children, results consistently show that those who are most morally disengaged are most likely to engage in various forms of aggression, including bullying and repeated criminal offenses. These same children are also least likely to engage in helpful behavior, revealing that moral disengagement dispenses with the typical process of self-censure and sanctioning that we carry around when we are morally engaged. In a study of American prison personnel involved in death penalty sentences, executioners were more morally disengaged than support staff or prison guards. Executioners were more likely to dehumanize the convicted prisoner and provide moral and economic justifications. Executioners also felt less guilt because they had developed a narrative to justify their actions, one that ascribed complete fault and responsibility to the victim. Support staff flipped in the opposite direction, fully involved with the weighty moral issues associated with ending someone's life. In a study of people's political attitudes, those with strong right wing authoritarian views, commonly associated with fascism and submission to authority, were more likely to support war by means of morally disengaging. In particular, they were most likely to support war by justifying its necessity and trivializing the harm that will necessarily arise — for

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example, invading another country is not aggressive, but designed as a pre-emptive strike to protect group interests.

Moral disengagement enables behaviors that are either immoral, illegal, or counter to deeply rooted intuitive prohibitions against harming others. It is a process that has the beneficial consequence of empowering soldiers to go to war under just causes, as well as the toxic consequence of empowering rogue leaders to carry out genocide under unjust causes. It is a process that allows us to hibernate from our moral responsibilities. It is a form of self-deception, a partner to dehumanization in the denial of reality. But self-deception, like deception of others, is not always harmful. In fact, it is often highly adaptive.

Angelic denial

In a nationally televised address in 2005, the Iranian President Mahmoud Ahmadinejad pronounced that the Jews had "created a myth in the name of the Holocaust and consider it above God, religion and the prophets." Judge Daniel Schreber believed that his brain was softening and that he was turning into a woman in order to form a sexual union with God. During a doctor's visit, a man reported that his pet poodle had been replaced by an impostor, masquerading *as if* he was the real deal. Judge Patrick Couwenberg stated under oath that he received the Purple Heart for military operations in Vietnam, and soon thereafter carried out covert missions in Southeast Asia and Africa as a CIA agent. The pilots of Air Florida flight 90 ignored signs from their dashboard indicating engine trouble and then proceeded to crash into a bridge, killing 74 of the 79 people on board. In 2008, while Hilary Clinton was running for President of the United States, she regaled admiring supporters with stories of her international experience, including her visit to Bosnia in 1996 where her plane was forced to land "under sniper fire", followed by a rapid evacuation for cover. When I was a teenager, I often walked onto the tennis court thinking that I was John McEnroe, serving and volleying like the world's number one player.

Each case above tells the story of a person who acted as if the world was one way even though it wasn't. The Holocaust and its trail of atrocities were real, confirmed by thousands of scarred survivors and the relatives who have heard their accounts. Judge Couwenberg was never in Vietnam, never earned a Purple Heart, and never had a connection with the CIA. There are no pet poodle impostors. Our brains don't soften, though they do deteriorate with age. When dashboard indicators suggest engine trouble, better to be safe than sorry when you are responsible for the lives of many people. Hilary Clinton landed in the exceptionally *safe* airport of Tuzla where she was *warmly* greeted by US and Bosnian officials. I am no McEnroe.

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In each of these cases, there was a mismatch with reality. The person harbored a false belief, but believed it was true. In some cases, the mismatch was due to psychosis, some kind of delusion or malfunctioning of the brain. These people didn't know that their beliefs were false. In other cases, the mismatch resulted from an intentional lie or distortion, a process that is adaptive, designed to promote self-confidence and manipulate others. When I conjured up images of McEnroe, I momentarily deceived myself. I believed it helped my game. I never thought I was McEnroe. I carried my self-deception honestly. When Hilary Clinton misreported her trip to Bosnia, perhaps she misremembered or perhaps she distorted her memory to convince voters that she had what was necessary to run the country — toughness and international experience. Unfortunately for Clinton, her comment about Bosnia was accompanied by other distortions, which led the American essayist William Safire to write "Americans of all political persuasions are coming to the sad realization that our First Lady... is a congenital liar."

Some cases of self-deception are harmless and even beneficial, as in my illusion of tennis grandeur. Others are only mildly harmful, as in Clinton's distortion of her political experiences. And yet others are deeply harmful, as when leaders such as Ahmadinejad deny the suffering of millions. The problem is that anyone can harness the power of self-deception for ill gotten gains.

Why does our mind play tricks on us, allowing us to believe things that are false? Why didn't evolution endow us with a reality checking device that is vigilant 24/7? The answer here parallels the refrain carried throughout this book: like its evil sister dehumanization, self-deception is Janus-faced, showing both an adaptive and maladaptive side. Self-deception allows us to protect ourselves from the reality of a current predicament or loss. Self-deception allows us to provide a better personal marketing brand to defeat our competitors in attracting mates and garnering other resources. Self-deception may even be critical to the functioning of a healthy and safe society: in a study of male criminal offenders, those with the lowest levels of self-deception with respect to their own self-worth showed the highest levels of recidivism. There is, however, a fine balancing act, revealing the slippery slope from adaptive to maladaptive: as studies by Roy Baumeister reveal, individuals with the highest self-esteem and the most overblown sense of themselves are also the ones most likely to lash out with extreme violence when someone threatens the reality of their stature.

The evolutionary biologist Robert Trivers was the first to identify the adaptive significance of self-deception and its connection to deception. As he insightfully notes in his book *The Folly of Fools,* what appears completely irrational about self-deception evolved as a consequence of selection to deceive competitors: "To fool others we might be tempted to reorganize information internally in all sorts of improbable ways and to do so largely unconsciously." The most effective self-deceiver acts without any sense of his true motives. He is on autopilot, driven by a purely self-interested mind. No checks and balances. Here, I build on this idea. I will show you how studies of pathology and healthy brain function

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illuminate the mental chicaneries that lead us down the road to self-deception. As with the dangers of dehumanization and its role in denying reality, so too is self-deception a dangerous state of mind, allowing individuals to inflict great harm while feeling aligned with the angels.

What did William Safire have in mind when he called Hilary Clinton a congenital liar? Congenital refers to a trait that is present in utero, at birth or soon thereafter. Congenital disorders, diseases, or anomalies typically refer to defects caused by a combination of genetic and environmental problems. A cleft lip is an example of a congenital anomaly, one that appears at birth as a gap in the upper lip. Because we don't have detailed records of Hilary Clinton's life as a child, it is hard to say whether her lying was congenital in the same way that a hair lip is congenital. We can rule out the *in utero* and *at birth* periods because Hilary, like all other children, was not born speaking or lying. These capacities mature. That she developed a tendency to exaggerate and distort is consistent with other reports. She falsely claimed that she was centrally involved in the creation of a Children's Health Insurance Program, an initiative that was actually created by Senators Ted Kennedy and Orin Hatch. She also claimed that she played a significant role in the Good Friday Agreement for Northern Ireland, a comment that Nobel laureate Lord William David Trimble described as "a wee bit silly." When Safire described Clinton as a congenital liar, what he was referring to was the habitual pattern of fabrication. When patterns of the mind become habits, they are hard to break. Each distortion, rehearsed over and over, becomes part of the fabric of truth. It is a life story that starts as fiction and ends up as non-fiction in the mind of the story-teller. We can begin to understand this transformation by looking at the clinician's notebook.

For more than 100 years, psychiatrists have described a syndrome known as *pathological lying*. If lying is pathological, it must deviate from some norm. The psychiatrist Charles Dike sums up the essence of this disorder:

> Pathological liars can believe their lies to the extent that, at least to others, the belief may appear to be delusional; they generally have sound judgment in other matters; it is questionable whether pathological lying is always a conscious act and whether pathological liars always have control over their lies; an external reason for lying (such as financial gain) often appears absent and the internal or psychological purpose for lying is often unclear; the lies in pathological lying are often unplanned and rather impulsive; the pathological liar may become a prisoner of his or her lies; the desired personality of the pathological liar may overwhelm the actual one; pathological lying may sometimes be associated with criminal behavior; the pathological liar may acknowledge, at least in part, the falseness of the tales when energetically challenged; and, in pathological lying, telling lies may often seem to be an end in itself.

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What seems most critical to the pathology is the lack of control which leads to repetitive lying over a long period of time. Compared with run of the mill liars, pathological liars often seem unaware that they are lying and do so many times a day as part of their daily habit. In the same way that birds have to fly and fish have to swim, pathological liars have to lie. If pathological liars are unaware of their lies and incapable of controlling themselves, then they are not responsible for the harm they impose. They have no choice. Unbeknownst to them, their brain has been hijacked by a creative fiction writer. They are following a script, but have no sense of its author.

Dike's summary is based on a loose and eclectic set of clinical observations. Several clinicians thus debate whether habitual lying counts as pathology and thus, whether it is worthy of an entry into the *Diagnostic and Statistical Manual of Mental Disorders*. For example, how can the clinician establish pathology given the evidence that healthy people lie about twice a day, physicians lie about 40-80% of the time to help their patients gain better health care, and lying within an experimental context increases as subjects generate more lies? My own sense is that despite the difficulty of defining the pathology with precision, clinicians have identified individuals that lie with every breath and often identify psychopaths by their calculated conning. These observations sharpen our approach to understanding the seeds of deceit and self-deception in the non-pathological condition. For example, does excessive and sustained lying stem from a specific problem associated with recognizing the truth or does it grow from a more general problem with self-control? Or, does the habitual liar suffer from an emotional deficit such that when he or she lies, there are no feelings of guilt and shame? Without these emotional regulators, it is impossible to learn from the harm caused. When healthy people distort the truth, they often feel bad. When healthy people think about distorting the truth, they often think about the potential harm and then silence the option to lie in favor of the truth. Perhaps unhealthy people never hear these emotional alarms. The mind sciences have begun addressing these issues.

The American neuroscientist Adrian Raine reported that individuals with a history of repeated lying and con-artistry have structurally different brains from non-liars, including individuals with a history of anti-social problems. Habitual liars have more white matter in the frontal lobes, but less grey matter. White matter consists of axons and myelin. The axon is the part of a nerve cell that carries information. It is like the electric cable that runs from the power station. Myelin covers the axon, at least in healthy individuals. It is like the fat around your bones, protecting and insulating neurons. Fat helps keep us warm. Myelin helps neurons transmit information. The grey matter consists of nerve cell bodies, which lack myelin. The function of grey matter is to connect up the neurons to transmit information between areas of the brain.

Raine suggests that the increase in white matter gives habitual liars the upper hand when it comes to lying, helping them suppress the truth, control their emotions, and mind read what others believe and

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desire. The decrease in gray matter allows habitual liars to lie without feeling guilty. The messaging center that sends healthy subjects moral reminders about the virtues of truth, is shut down or barely audible within the mind of a pathological liar. The brain of a pathological liar allows for the ultimate poker face. The brain of a healthy individual allows us to perfect the poker face by repeating a distorted narrative, converting a lie into a self-justified truth. This is dangerous denial.

When we lie, either to manipulate someone else or ourselves, we distort the truth. We can either do this on the fly or use a narrative held in long-term memory. When Hilary Clinton told her supporters that she had to dodge bullets in Bosnia, she either lied in the moment to convey a stronger image or she developed this distortion over a long period of time. In the first instance, she knew that her comment about Bosnia was false. She was deceptive, but not self-deceived. In the second case, she was self-deceived and most likely unaware. Her narrative was so clear that she could picture running for cover without the usual welcoming party. Several studies now reveal that both forms of lying engage brain areas associated with self-control and conflict— the right backside of the prefrontal cortex and the anterior cingulate. This makes sense. To tell a lie, either to oneself or another, requires controlling what we know about reality to convey an alternative reality. When we hold both versions of this narrative in mind, there is conflict. As we rehearse one version more than the other, the conflict dissipates. The more we rehearse, the more we push this narrative into long term memory. The more we push this narrative into long term memory, the more it becomes part of what we believe is true. The more we believe it is true, the more we hold onto a narrative that can be used to justify our actions.

The imaging results fit well with our understanding of which brain regions are involved in self-control, conflict, memory, and social knowledge. To understand which regions are either necessary or sufficient for representing truths and lies, we turn to a technique called *transcranial direct current stimulation*. This method allows researchers to safely increase or decrease activity in a brain area through electrical stimulation. Think of this technique as a volume knob on an old fashioned radio. Turn it clockwise and you amplify the signal. Turn it counter-clockwise and you quiet the signal. When the German neuroscientist Ahmed Karim and his colleagues applied this technique to the right backside of the prefrontal cortex, and decreased activity, healthy subjects were better at telling lies, lied without guilt, and were less stressed out as measured by the sweatiness of their skin. This pattern mirrors the natural state of pathological liars. Absent the circuitry in the brain that exerts self-control over our distortions, Karim turned healthy subjects into conscience-free, poker-faced, liars.

If self-deception and deception are not only part of normal brain function, but adaptive processes, then what makes this system turn toxic? What tips the brain over to the dark side, allowing self-deceptive illusions to empower the individuals and groups to cause great harm?

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I am God!

Across the globe, in Eastern and Western cultures, clinicians have reported a consistent pattern of psychotic delusion, typically associated with schizophrenia: many believe that they are God, God's messenger, or the Devil, equipped with extraordinary, invincible powers. This is the same disorder that led the Australian gentleman we encountered at the start of this chapter to believe that he had two heads and heard the voices of Jesus and Abraham. Estimates reveal a greater number of cases among Catholic than Islamic or Protestant societies, and the fewest among Hindu societies, although experts are uncertain as to why such particular biases exist. The interesting point is that there are individual differences in the expression of religious delusions that are at least partially mediated by the particular beliefs and customs of the religion. Religious delusions are also held with greater conviction than other delusions, more resistant to change, and often result in self-mutilation or harming others; when harm occurs, it follows the narrative from a religious text, plucking out eyes or cutting off genitals as the means to cleansing sins.

What makes religious delusions like these, in which the individual has created a narrative of supreme confidence and power, different from non-delusional, non-psychotic forms of distortion? In a Gallup poll, 10% of the Americans surveyed claimed they had spoken with the devil. In several psychological experiments, healthy non-psychotic subjects consistently report that they are smarter than most, more attractive, and more likely to win than lose an athletic competition. Though some of these people are correct — they are in fact smarter, more attractive, and better competitors — most are wrong and yet believe they are right. What this research reveals is that we all suffer, some more than others, from positive illusions — biases that distort our sense of confidence, control, and invincibility These illusions differ from delusions in that they are less fixed, more flexible, and more amenable to change. Delusions are highly maladaptive, a signature of brain dysfunction, and the source of great suffering. Positive illusions, in contrast, are often highly adaptive, generating the confidence necessary to take on great challenges and challengers, convincing an audience or a group of opponents that we are stronger, smarter, and sexier. Positive illusions have been linked to direct mental and physical health benefits, including evidence that distorted optimism can slow disease progression. Positive illusions are, as noted by the biologists Richard Wrangham, Robert Trivers, and Dominic Johnson, a form of self-deception with considerable evolutionary benefits. But like the runaway capacity of desire, so too can our illusions of grandeur runaway. When this occurs, illusion and delusion are virtually indistinguishable. What was once a narrative centered on the grandiose belief of being *god-like* has been transformed into the belief of being *God*, leading individuals and groups to engage in extreme extortion or violence, not only blind to

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obvious risks but incredulous that there would be any risks. This is denial. This is another way in which we close off our senses to reality in order to create our own imagined reality. How does this process get started?

It is not until the age of about 18-24 months that we acquire the ability to recognize ourselves in a mirror. It is not until a couple of years later that we have a sense that our own beliefs can sometimes differ from others that we interact with. It is not until this time that we develop the capacity to deceive, along with a powerful suite of social emotions that enable us to feel embarrassed, envious, and elated. These feelings link up our sense of self with our sense of others. These are comparative feelings and beliefs, and they feed back to who we are, either building up our self-confidence or crushing it. When my daughter Sofia was ten years old, she announced that she will one day go to Brown University — attracted by their course offerings and the fact that Emma Watson, aka Hermione Granger of Harry Potter fame, was a student — be rich and have five children — she wanted more siblings and has always had a taste for the luxurious — obtain a veterinarian degree — my wife is a veterinarian and we have five pets — open a restaurant — I love to cook — and be an Olympian in gymnastics — sports run in our family. Sofia was not delusional, but brimming with uncalibrated confidence. Her confidence was uncalibrated because she had no sense of what it takes to get into Brown, become rich, take care of five kids, obtain a vet degree, open a restaurant, and win gold. My wife and I would be horrid parents if we burst her bubble. We would be irresponsible parents if we didn't, over time, describe the exciting challenges associated with each of these desirable goals.

Developing a sense of self depends on at least two capacities: looking inwards at what we know and are capable of doing, and looking outwards at what others know and are capable of doing. When we look inwards, if we honestly open our eyes to the richness of our autobiography, we will recognize cases where we have succeeded and those in which we have failed. This history reveals our knowledge and ignorance, our strengths and weaknesses, and our capacity to exert control or meld to external forces. When we look outwards, again with an honest, panoramic perspective, we learn about those who know more or less than we do, about those we can outcompete and those we lose to in defeat, and about situations that undermine our capacity for self-control. Distortion enters these personal narratives when we either lack information or filter it in some way, consciously or unconsciously.

The British criminology scholar Mandeep Dhami examined positive illusions in criminals incarcerated in prisons within the United States and the United Kingdom. Because recidivism levels are high among convicted criminals, with 40-60% of offenders re-convicted after 1-3 years from release, it is important to understand risk factors. One possibility is that criminals believe that their prior offense was just a one-off event or bad luck, and that, of course, they will never engage in crime again, having learned their lesson and feeling fully confident in their capacity to lead a crime-free life. Based on a sample of

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over 500 prisoners from medium security prisons, 60-80% believed that they would find a place to live as well as employment once released, whereas less than 30% felt that they would commit another crime. Prisoners also felt that they were much less likely to commit another crime than other prisoners. Thus, whether prisoners were evaluating their own chances of success or their success relative to others, they were living with a distorted narrative. The shorter the criminal record, the more distorted the narrative. Repeated experience with crime appears to anchor the narrative in a more realistic assessment of the future.

Certain experiences can also enhance positive illusions by giving individuals an unrealistic sense of self-control, along with a distorted expectation that future outcomes are highly deterministic. For example, people who are wealthy, highly educated, part of a dominant group, or citizens within a society that values independence, are more likely to believe that they have control over the future and are more likely to express optimism and high self-esteem. These attitudes often lead to a boosted sense of control and an illusory sense of control over future outcomes. The American psychologist Nathanael Fast ran a series of experiments to further explore the relationship between power and illusory control, specifically asking whether subjects endowed with power expect control over outcomes that are strictly due to chance or that are unrelated to the domain of power. Across each study, whether subjects recalled a personal situation where they were in power or had to imagine being in power, they were more likely than those in a subordinate position to express confidence about the outcome of rolling a six-sided die, predicting the future of a company, and influencing the results of a national election. Power and winning distort, a tale that has been told and retold countless times in the annals of industry and warfare. As the American business administration scholars Francesca Gino and Gary Pisano note, the business world is full of cases where leaders and leading companies crash because they fail to examine the causes of success. They assume, for example, that their success is entirely due to their brilliance, control over the market, and the weakness of the competition, as opposed to a shot of good luck. So too goes the story of unexamined war victories, as supremely confident generals discount relevant information about their opponents, leading battalions on a death march. Our willingness to accept victories without question stands in direct contrast with our motivation to scrutinize failures, drilling down for explanations or causes. When we lose or fail in some way, the negative emotions accompanying this experience focus our attention on working out an explanation. When we win, we bask in the glory, fueled by the brain's chemicals and the body's hormones. This physiological orchestration sets up the positive illusion of overconfidence, a winning card in many competitive arenas, and a disaster in others.

Recall from chapter 1 that our brains, and the brains of other animals, are configured to reward victory with a cascade of hormonal and neurobiological changes. Winning delivers a shot of testosterone, and so too does observing others win. Winning also delivers a shot of dopamine, further generating a

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honey hit to the brain when we shine. There is evidence that schizophrenia is associated with a dysfunctional dopamine system, which might help explain the overconfidence in their beliefs, especially beliefs in powerful religious icons. Winning boosts confidence, which increases the chances of winning again. This is a highly adaptive cycle that can lead to overconfidence.

Dominic Johnson took advantage of the research on human and animal competition to explore the link between overconfidence, testosterone, and war within the context of a simulated game. Each subject played the role of a leader in a country at war with another over diamond resources. The goal of the game was to accrue the highest level of resources or defeat the neighboring country. Though war games on a computer can not capture the full reality of war, the fact is that military specialists throughout the world use simulations to prepare combatants for some of the strategic and emotional problems they will confront.

Most subjects judged that they would outcompete their opponents, and this was exacerbated in males relative to females. Those who believed that they would whip their opponents actually had the worst records, suggesting that they were not only uncalibrated but that their distortion of reality led to costly outcomes. Those with the highest expectation of victory had the highest testosterone levels and were most likely to launch unprovoked attacks on their opponents.

Whether in real life or in the simulated world of computer games, brimming overconfidence can lead to a distorted sense of risk and the odds of victory in war — or any competitive arena. Though this is a costly strategy, there are clear evolutionary benefits under conditions explained by Trivers and Johnson. Self-deception is favored when opponents have imperfect information about their strengths and weaknesses, and where the payoffs are high relative to the costs. Self-deception leads individuals to go for it, convincing themselves and others that the risks are low, the gains are great, and the standard social norms are no longer applicable. This is a dangerous form of denial, recruiting moral disengagement to justify horrific means and ends. This is a piece of the psychology that can facilitate the process of runaway desire. This is a piece of the psychology that enables individuals to cause great harms.

My goal in this book has been to find the universal core of evil, the elements or ingredients that are shared across all cases of evil. My suggestion is that the mixture of desire and denial are both necessary and sufficient ingredients in the recipe for evil. All other ingredients are flourishes, creative additions that do not take away from the universal core. Within each of us is a recipe for causing excessive harm and for expressing exceptional compassion. We have choices. But as evidence accumulates from the sciences, it has become increasingly clear that some of us have fewer choices than others. Some of us are equipped to resist the temptations of a culture of evil, while others fall prey. This is the story of our species. This is our story.

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Chapter 4: Wicked in waiting

> The wicked are estranged from the womb: they go astray as soon as they be born, speaking lies.
>
> ***— Bible, Psalm 53:8***

Growing up is a lottery. No one has a say over their genes or their parents, including the environment that is created on their behalf. For individuals raised in poverty, abused by parents or abandoned by them, there may come a time when it is possible to purge the past, rise above it, and lay down new tracks. Success in this endeavor depends upon biological potential and the environment's toxicity. Though every healthy human being acquires the same basic biological ingredients, individual differences in how our biology expresses itself can either provide immunity against toxic environments or deep vulnerabilities. The unlucky ones inherit genes that predispose to sensation-seeking and risk-taking, callous and unemotional attitudes toward others, weak self-control, and narcissistic leanings. With this lottery ticket, it takes little to trigger the mindset of an evildoer. And yet some resist. An impressive accumulation of scientific evidence helps explain the source of these individual differences, including its role in sculpting different personality profiles that either deviate greatly from societal norms or follow them to perfection.

What's normal?

Much of our fascination with evil stems from the distinct impression that evildoers are anomalies. Their actions are inhuman, unimaginable, rarely witnessed, and detrimental to our species' survival. This impression carries with it an assumption about what is expected or typical of our species, as well as what is possible. It assumes that evildoers have thoughts, feelings, and desires that fall outside of the repertoire of an average human being. Their actions are unimaginable because most human minds lack the capacity

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to imagine butchering human bodies. Like so many simple claims that go unchallenged, we should be puzzled by this one. We should ask: what's normal?

The evolutionary history of each species' brain does not provide a complete account of what the brain can do. Consider again a topic from chapter 1: domesticated dogs and their ancestors, the wolves. Though dogs live with humans, and are often raised by them, they never acquire a human language. In this sense, the domesticated dog is just like the wolf. But what dogs can do, with greater facility than any wild wolf, is understand a variety of human gestures such as pointing and the movement of our eyes. This capacity emerged following a period of human domestication. Wolves were not part of this selective regime. But, and this is the most interesting twist in the story, wolf puppies raised by human caretakers develop into adults that can read pointing and looking extremely well. This tells us that even wolves evolved the potential to read human gestures, but only human environments favor this skill. This tells us that what animals express is not necessarily indicative of their potential. To uncover their potential, we must alter the environment or wait for such changes to happen naturally.

When we ask *What's normal?*, we are asking two questions: what is the evolved repertoire and what is the evolved capacity? The evolved repertoire tells us something about the relationship between a species' biology and the environments that have shaped their behavior. The evolved capacity tells us about a reservoir of behaviors that may only emerge in novel environments.

What's normal human behavior? The same distinctions apply to us as to dogs and wolves, with the extra complication that our species adds because of historical twists and turns orchestrated by legal, political, ethical, religious, and medical points of view. History presents us with hundreds of cases where an accepted normal mutated into abnormal, or where abnormal transformed into normal. During the Italian Baroque — a period of decadence that started in the late 16th century and ended in the early 18th century — some 500,000 boys were castrated in order to freeze their youthful voices for the enjoyment of others. These castrati formed an essential part of music culture, of what people expected and wanted. For many of these young boys, not only did castration end their reproductive careers, but often, their lives.

As the 18th century drew to a close, so too did castration in the name of art. What was normal then is perceived as abnormal and heinous today. The same story can be told for other sexual practices, including female genital mutilation, circumcision, and homosexuality. In the United States, homosexuality was considered a disease before the 1970s, with its own entry in the *Diagnostic and Statistical Manual of Mental Disorders*. Thanks to an underground movement of gay psychiatrists and the work of Evelyn Hooker who discovered that the manual's classification entry was based entirely on clinical interviews of gay prisoners, homosexuality has been freed from its jail sentence as a mental disease — as abnormal.

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When clinicians diagnose individuals with a mental disorder, they are making a statement about deviance, about what falls within and outside the range of normal mental states. Unfortunately, there are no clear categories, no bright lines separating normal from abnormal or uncommon. As the distinguished American psychologist William James noted, however, studying "the abnormal is the best way to understand the normal." Let's follow this logic.

Consider the developmental disorder of autism. This disorder, typified by difficulties understanding what others believe and feel, ranges from individuals who appear locked out of the world, rocking back and forth to their own internal rhythm, to high functioning individuals such as Professor Temple Grandin, who not only teaches college-level courses, but has done wonders as a spokesperson for autism and for the animal welfare movement. This range already tells us that autism is represented by a spectrum, once identified by purely behavioral measures, but joined today by genetic and neurobiological markers. The genetic evidence is particularly helpful for explaining the observed variation. For example, the MAOA gene, located on the X chromosome, is involved in the regulation of social behavior and has different forms that map to differences in brain activity and stress physiology. The different forms correspond to the number of copies of the genetic material. This copy number is, in turn, partially responsible for the spectrum of autism observed, especially the degree of social dysfunction, including stress and aggression. Once we admit to a spectrum, and begin to pinpoint the factors that push individuals to stand on one end or the other, we must admit to admitting virtually everyone onto this spectrum. All of us, at some point in our life, have lacked sensitivity to the feelings and beliefs of others. All of us have been self-absorbed and locked out from the rest of the world. All of us have failed to express empathy and compassion to others. All of us have been a bit abnormal in this sense. All of us fall, on occasion, within the spectrum of autism as well as other disorders of the mind such as psychopathy.

Like autism, psychopathy is not one neat and tidy disorder, but a spectrum. Diagnostically, psychopaths are impulsive, narcissistic, and lacking in social emotions such as empathy, remorse, and guilt. These behaviorally defined characteristics are complimented by genetic and neurobiological markers, some pointing to risks in the pre-school years, and linked to the same MAOA gene noted above. The spectrum that defines psychopaths ranges from hyper-smart, calculating, and powerful politicians to low IQ, downtrodden, serial murderers. Everyone of us occasionally shows our psychopathic face: self-absorbed, impatient, manipulative, and uncaring. What is abnormal, then, is living with these characteristics, all the time. Clinically diagnosed psychopaths, like clinically diagnosed individuals with autism, have the characteristic traits as stable components of their personality. An honest clinician will tell you, however, that stability is difficult to define, and so too are the essential traits. An honest brain scientist will also tell you that, despite the observation that psychopaths have hyperactive dopamine brain

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circuits that may drive sensation seeking, along with smaller frontal lobe circuits that may minimize their sensitivity to punishment and the capacity for self-control, these differences are statistical. What "statistical" means is that if you were to stack up all of the brains with hyperactive dopamine circuits and smaller frontal lobes into one pile, most, but not all would be from psychopaths. You would also find psychopaths in the pile of brains showing normal dopamine activity and average-sized frontal lobes. These brain differences are interesting, but they are not yet like fingerprints, absolutely and uniquely distinctive and diagnostic of a disorder. Such honesty reveals the challenges we face in answering the simple question *What's normal?*

Lawyers, judges and juries face the same problem as clinicians, often relying upon documents such as the DSM to determine when someone has acted outside the range of normal behavior. But for legal cases, there are two relevant layers of the normalcy problem. The first concerns whether the supposed criminal was sane or insane. An insanity defense requires evidence of a disease or defect of the mind. It requires evidence that the individual lacked the capacity to appreciate the criminal nature of the act as well as the capacity to conform. This is the part that relies on the DSM, as well as clinicians who can testify based on their expertise. The second concerns a more general understanding of what a prototypical or normal human would or could do in a given situation. The idea seems straightforward enough, but as I mentioned above, is only deceptively straightforward.

Crimes of passion provide a useful illustration of the challenges we face, especially with respect to understanding how harm is ignited in the face of moral norms against it. Highlighting the truism that love makes you crazy, the crime of passion defense is invoked for cases where, in the heat of the moment, an individual finds and kills his or her spouse in bed with a lover. The defining feature of a crime of passion is that it was not planned and *most* people faced with the same situation would act similarly, unable to control their emotions.

The crime of passion defense seems straightforward. Like autism and psychopathy, however, it too relies upon a diagnosis of what a prototypical or average person *would* do in the same situation. This diagnosis requires an understanding of two difficult mental states: planning and self-control. Planning involves imagining the future, time traveling to a new world, dreaming up what we might do and how we might feel. We plan in the short and long term, filling up our mental sticky notes with to-do lists. Self-control enters into planning because what we imagine for ourselves — what we desire — is often inappropriate or unethical because it harms others or ourselves. As noted in chapters 2 and 3, the capacity to keep desire in check relies on moral engagement. Moral engagement requires self-control. Moral disengagement requires denial in order to loosen the grip of self-control and enable desire to have its way.

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When Lorena Bobbitt cut off her husband John Bobbitt's penis, she fulfilled her desire to harm another. She carried out this gruesome act despite the moral and legal sanctions against it. But she did not plan this act in advance, and nor did it occur in the heat of the moment, triggered by finding her husband in bed with a lover. It followed in the wake of his repeated philandering, attempted rape and psychological abuse. As an act, it fell between the cracks of a long-term plan and a reflexive response — it was hatched on the night of the fatal attack, triggered by seeing a carving knife in the kitchen. Lorena either lost self-control for that fatal moment or she was in complete control, aware of what she was about to do and justified by her own moral convictions, believing that harming John was just deserts. John was most definitely not innocent. The jury delivered a "not guilty" decision, appealing to a crime of passion defense. This decision effectively excused Lorena's harmful act as normal and justified given the mitigating circumstances.

When we consider the nature of evil, we must pause to consider our own biases and prejudices about what's normal. We must ask about the human potential, about our evolved capacities and our ability to behave in novel ways in novel environments. When we say that a person, group or nation is evil, we are saying something important about human nature, about our capability as a species. We are saying something important about the relationship between nature and nurture.

Evil eggs and corrosive coops

How much do career criminals cost? Estimates from the United States suggest that if you can prevent a high risk child from entering this career, you save $1.5-2 million in costs of education, mental health, and criminal fees. Educational facilities such as the Penikese Island School in Massachusetts, where I have had the privilege of working, spend about $100,000 per student per year to keep high-risk teens off the streets and out of jail. Based on statistics collected by the Federal Bureau of Investigation, approximately 100,000 individuals under the age of 18 years were arrested in 2007 for violent crimes — murder, forcible rape, and aggravated assault. If we had nurtured and educated these teenagers before they committed such crimes, we would have saved close to $100,000,000,000. Violent crime prevention pays. How does a career of violent crime start? Are there early warning signs? How early? How much starts with the egg and how much with the coop in which it was raised?

Early scientific interests in this chicken and egg problem can be traced to the efforts of the Italian physician and psychologist Cesare Lombroso. In 1876, he published his magnum opus *The Criminal Man*. This was a serious, scholarly book aimed at understanding "whether there is a force in nature that causes crime." Based on measurements of both anatomical and psychological characteristics, Lombroso

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concluded that criminals were born not made. Their defining features were throwbacks to our evolutionary ancestors, dehumanized by biological defects. Modern man was civilized and elegant. Criminal man was barbaric, a savage with slanted forehead, jutting jaw, and excessively long arms. Criminal man was more ape-like than human-like. Because the cause of these differences was biological, Lombroso argued that a life of crime was inevitable. Change through rehabilitation was hopeless. To protect society, these natural born criminals had to be taken out of society, either locked up or executed. These ideas formed the basis of several eugenics' movements, with the aim of weeding out the undesirable, less than human elements of society, be they less intelligent, from a non-Caucasian racial group, or from a culture with different religious beliefs.

Lombroso's theory of criminality was soon rejected as scholars from a variety of different disciplines unearthed its racial stereotypes and shoddy methods, including a failure to include the many people with slanted foreheads, jutting jaws, and long arms who never committed crimes, and those with statuesque anatomy who did. This initiated a general skepticism and even fear of biological explanations, causing a swing in the opposite direction. Criminals were not born but made by corrupt societies. Humans are not born with biologically encoded scripts for behaving with malice or virtue. Rather, we are born with blank slates, waiting for society to inscribe its distinctive signature. So began a pendulous swing from nature to nurture. Though the oscillation continues to this day, there is increasing appreciation, perhaps especially in the arena of criminology, that both nature and nurture make important contributions. This change comes, in part, from a far greater understanding of genetics, combined with long term studies of how humans and other animals develop within environments that are either nurturing or damaging.

Consider the MAOA gene that I mentioned in the last section. This gene produces an enzyme that goes by the same shorthand of MAOA, or **M**ono**A**mine **O**xidase **A**. MAOA is evolutionarily ancient, shared with other animals, and has two different forms — *low* and *high* — that influence the level of serotonin as well as the brain areas involved in social evaluation and emotional regulation. Early evidence for the critical role of this gene in social behavior emerged from a study that knocked it out of operation. If you knock out the MAOA gene in mice, they quickly become hyper-hyper-aggressive. These genetically transformed mice have no capacity to regulate their social behavior. Consequently, all interactions are treated as confrontational and handled by aggressive attacks. These results are consistent with a large body of work in animals showing that heightened aggression and low levels of serotonin go hand in hand. These results are also consistent with work on humans. In, 1993, the Dutch biologist Hans Brunner analyzed the genetics of a large, extended family. Some individuals within this family were born with a defect that silenced the operation of the MAOA gene; they were like the mice who had this gene silenced. Relative to others in the family, these individuals had a pronounced history of violence,

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including murder, rape, and arson. Oddly, although this work provided one of the cleanest links between genes and violence in humans, it slid under the radar of scientific attention, only to be resuscitated and enriched about ten years later.

The behavioral geneticists Avshalom Caspi and Terry Moffitt studied a large population of young boys over several years. Though boys and girls have the MAOA gene, its effect on behavior is easier to study in boys because they have only one copy whereas girls have two, one for each of their two X chromosomes. For each boy, Caspi and Moffitt collected information on the presence and frequency of their antisocial behavior and whether they were raised by parents who were caring, mildly abusive, or severely abusive. For each boy, they also noted whether they had the low or high expressing form of MAOA.

Caspi and Moffitt's results provided a textbook example of nature's interaction with nurture. If the parents were caring, the genes made no difference in their child's personality or behavior. If the parents were mildly abusive, the boys with the low activity form were nine times more likely to fight, steal, bully, and defiantly break rules. For those boys with severely abusive parents and the low activity form of MAOA, 85% developed into violent, delinquent criminals. What these findings tell us is that in humans, it makes little difference which form of MAOA you have if you grow up with nurturing parents. But if you grow up with abusive parents, your genes make all the difference in the world. Those with the low expressing form are more likely than not to develop into delinquents, whereas those with the high expressing form are more likely than not to develop immunity. By a double dose of bad luck, one shot from the genes and one from the environment, some have a high probability of entering into the pool of potential evildoers.

The German neuroscientist Andreas Meyer-Lindenburg took the genetic work one step further, linking the particular form of MAOA up to differences in the brain. Those with relatively poor social regulation and the low expressing form of MAOA had significantly smaller brains, specifically in regions associated with the control of emotion and social behavior — the amygdala, anterior cingulate, and prefrontal cortex. These individuals also had less connectivity between these regions, harking back to the importance of promiscuity both between humans and other animals, but also within our own species. Less connectivity translates to less control by the frontal areas of the brain over emotion-relevant areas such as the amygdala. When individuals with the low expressing form viewed angry or fearful facial expressions, the emotionally-relevant brain areas went into hyper-drive, whereas those areas involved in regulating emotions hibernated. Thus, in contrast with individuals who have the high expressing form of MAOA, those with the low expressing form are overwhelmed by emotionally charged experiences, lacking the mental brakes to stay cool. By luck of the draw, the low expressing form of MAOA builds a child that is

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more likely to get angry and violent in the face of frustration and other emotional challenges, whereas the high expressing form builds a child that is walled off, immune to the same challenges.

MAOA is crucial not only in long term human development, but also in everyday, ephemeral social interactions. In a laboratory study, an experimenter offered subjects the opportunity to earn up to $10 on a vocabulary quiz. Once they finished the quiz, they learned that an anonymous person in another room either took some of their earnings or left it alone. With this information in hand, the quiz-taker could either vindictively punish the person by giving them some hot sauce or they could cash out of the game and recover the money lost. In other words, they could either vindictively burn their opponent or recover their losses at no cost. In reality, there was no partner in the other room. When subjects with the low expressing form of MAOA lost most of their earnings, they were far more likely to deliver the hot sauce than those with the high expressing form; they were also most likely to deliver the highest amount of the sauce. Like long-term parental abuse, even short-term provocation invoked in a laboratory environment can cause those with the low expressing form of MAOA to act out and attack.

As with all genes that have different forms, the number of individuals with the low expressing form of MAOA varies by population, including different ethnic and culturally identified groups. Caucasian and Hispanic males show some of the lowest frequencies at 34 and 29 % respectively, whereas Maori, Pacific Islander, and Chinese males show the highest at 56, 61, and 77% respectively. In a study of over 1000 men, individuals with the low expressing form of MAOA were more likely to be in violent gangs, and once in gangs, were more likely to use guns and knives than individuals with the high expressing form. Variation in the frequency of these two forms is interesting as it provides the signature handiwork of natural selection. When the frequency of one form goes up, the most likely explanation is that this form benefits the individual carriers. When the frequency goes down, there is a hidden cost. In light of this teeter-tottering of frequencies, the Maori are of interest. As celebrated by many New Zealanders today, the Maori were a highly adventurous and warring people. Individuals who took risks and fiercely defended their resources were heroes. Heroes may have been carriers of the low expressing form of MAOA. Heroes often leave more offspring, who were also carriers of the low expressing form. In the Maori environment, selection may well have favored this form of the gene. The important point is that different environments will favor different frequencies of the two forms of MAOA. This helps explain both the cause of individual differences and the challenges we face in confronting cultures of violence that are fueled by nature and nurture.

Many other labs have followed up on Caspi and Moffitt's long term, developmental study. Most find the same relationship between the MAOA gene and antisocial behavior. Others add to this account by showing how different genes and early appearing physiological differences contribute to a highly aggressive and antisocial starting state. In one study, the German psychologist Alexander Strobel put

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subjects in a brain scanner and invited them to play a bargaining game where they could punish someone who acted unfairly to them — personal revenge — or punish someone who acted unfairly to someone else — impersonal punishment. For each subject, Strobel also collected information on a gene called *COMT Met.* This gene has three different forms, linked to differences in activity level in the frontal lobe of the brain, which are linked to differences in the levels of dopamine, which are linked to differences in the experience of reward. Given the different forms of COMT Met, at least part of what we experience as the feeling of reward or gratification was determined by our parents, and our parent's parents, and their parent's parents, all the way back to our ape-like cousins who evolved this gene.

When Strobel looked at the brain scans of his subjects, he found that the same circuitry was engaged for personal revenge and impersonal punishment, with significant activity in the striatum — a reward area — as well as in the insula — an area involved in the feeling of disgust. When we detect an injustice, we feel disgusted, a feeling that may motivate our desire for retribution. The striatum finishes off the process, rewarding us for our punitive response, and wiping out the negative feeling of disgust. Importantly, individuals with the high expressing form of COMT Met, and thus, higher levels of dopamine, showed stronger activation in the striatum, and were more likely to punish those who act unfairly. Strobel suggests that those with the high expressing form punished more because they anticipated a higher level of reward. If this explanation is right, it has profound consequences for how we think about individual participation in the policing of norms and the honey hits associated with aggression. Some people will have a natural bias to shy away from punishment, not because they fail to see the importance of ratting out cheaters, but because they don't anticipate feeling good about it. Others will be prone to punish even the most minor infractions because they feel empowered and good about it. Those who are empowered to punish because it feels good have forged a stronger association between aggression and reward. Unbeknownst to these individuals, they started life with a bias, one that colored their willingness to harm others. This bias is joined by many others that I discuss in the next few sections.

The take home message is that if you are born male, endowed with certain genetic variants such as the low activity form of MAOA, and experience physical and psychological abuse by your parents, the odds of delinquency are frighteningly high. That's the bad news. The good news is that if you are born male, have the high activity variant of the MAOA gene, and experience physical and psychological abuse by your parents, you are vaccinated by nature against the harms of your unfortunate nurture. The problem, of course, is that you have no say over which endowment you get, nor over the kinds of parents you receive.

One of the reasons I have worked through this case study of genetic constraints and environmental sculpting is to provide an antidote to the often polarized views that have dominated much of the historical and psychological literature on evil. Many of the earliest, and most famous psychological

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experiments were related in one way or another to Hannah Arendt's thoughts about Adolf Eichmann and the fact that good people are capable of horrific things: the banality of evil. Hiding behind every average Joe is a person equipped with an engine of malice. Banality is the veil of evil. Thus, the American psychologist Stanley Milgram showed that normal people were capable of shocking innocent others when an authority figure told them to do so; of course, there were no shocks, but the subjects believed they were real. Similarly, the American psychologists Solomon Asch and Philip Zimbardo showed that normal people followed group attitudes and instructions, bleating like mindless sheep, no reflection, no critical thinking, no concern about the consequences of their actions. In Zimbardo's study — the famous Stanford prison experiments — run of the mill undergraduates playing the role of prison guards turned into little dictators, mentally and physically abusing their run of the mill undergraduates playing the role of prisoners. Together, these studies seemed to support a blank slate view of the mind, a tablet waiting for inscription by the local culture, with no constraints on the written matter.

A closer look at many of these studies reveals far more variation in how individuals responded, suggesting that differences in their genetic make-up and personal experience either facilitated their willingness to follow authority and ideology or prevented it. Many subjects in both the Milgram and Zimbardo studies refused to follow the orders or rules of the game. Those who refused tended to identify more with the victim and less with the authority figure or ideology. This suggests important differences in the capacity to experience empathy and compassion for another. Studies by the cognitive neuroscientist Esse Viding show that by the pre-school years, some children have a diminished capacity for empathy, expressing a deeply callous and unemotional character. These children exhibit severe conduct problems, especially violence. These children lack remorse and an awareness of others' distress. They are cold, heartless kids. If they have a twin, they are more likely to share this callous-unemotional personality than two unrelated children, revealing the trademark of a powerful genetic engine. More boys than girls fall on the high end of this callous-unemotional scale — where high translates to colder and more callous. Those who score highest on the scale engage in more direct physical bullying than those who score lower. High scorers lack the skills to modulate their behavior following direct or anticipated punishment. These individuals also show reduced activity in the amygdala, a part of the brain that is critically involved in regulating emotion, especially the assignment of a positive or negative value on our actions and experiences. These individual differences persist into adulthood. These are the kind of individual differences that can explain why some followed Milgram and Zimbardo's instructions to perfection, while others resisted, exerting self-control.

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The sweetness of control

When humans and other animals travel the road to excess, whether for food consumption, violence, power, or sex, it is either because they gave in to an in-the-moment impulsive itch or because a history of losing self-control turned into an addictive habit. What causes us to lose our sense of moderation, allow our mental brakes to slip, and give in to temptation? What causes our preferences to inconsistently and irrationally shift over time, allowing seductive offerings to win? If you are the eminent social psychologist Roy Baumeister who has contributed fundamental insights into the nature of evil, the answer is simple: sugar. Love it. Want it. Need it.

When we work hard, focusing on a difficult problem or trying to figure out the best decision, exhaustion strikes. Part of our exhaustion comes from the fact that we have depleted a critical resource: sugar, or more precisely, glucose. When the availability of this resource diminishes, we also lose self-control. This is why the loss of self-control has a cycle that follows the time of day, with the greatest losses occurring late rather than early: diet breakers are more likely to pig out in the evening than early in the morning; shoppers are more likely to buy impulsively as the day moves on; impulsive crimes and relapses of addiction are evening affairs; judges are more likely to dole out punishment at the end of a day in court than when they start a new day. Dozens of experiments show that if you have to exert self-control in one context it taxes your capacity to exert self-control in another. For example, if you ask subjects to avoid laughing while watching a comedy routine, avoid thinking about a white bear, or avoid eating chocolates now to have radishes later, these same subjects will squeeze a hand grip for a shorter period of time than subjects who never contended with the various self-control tasks. When you deplete your personal resources, you lose your grip, opening yourself up to binge eating, unnecessary violence, sexual promiscuity, and drug relapses.

How do we know that glucose is responsible? If you give people a milkshake with real sugar before they have to take a hard test involving self-control, they do better than if you give them a milkshake with an artificial sweetener. If you first make people take a test that taxes their attention, and causes their glucose to drop, they do worse on a subsequent test, including the hand grip squeezing test. In an extraordinary series of experiments and observations, the American psychologist Nathan DeWall found that subjects who drank lemonade with glucose were less likely to respond aggressively to an insult than subjects who drank lemonade with artificial sweetener; individuals with diabetes — who have difficulty regulating blood glucose, and thus have less of it — reported higher levels of aggression on a questionnaire than non-diabetics; within the United States, those states with higher numbers of diabetics showed higher crime rates; and countries with a higher frequency of a genetic disorder that lowers glucose levels showed higher killing rates both in and out of war.

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To accept DeWall's striking results, it is necessary to accept one connection between self-control and aggression and a second between glucose and self-control:

SELF-CONTROL DOWN → AGGRESSION UP
GLUCOSE DOWN → SELF-CONTROL DOWN

That aggression often follows from a loss of control is backed up by considerable evidence, including clinical studies that link lack of inhibition in psychopaths to extreme violence. Also of interest is the fact that impulsive aggression is more likely to arise when individuals are drunk than sober. Alcohol, as we all know, lowers our inhibitions, but also lowers glucose in both the brain and body. Though scientists such as Baumeister and DeWall have not yet worked out in detail how glucose is used or replenished in the context of self-control, there are far too many studies using different methods and subjects to ignore this relationship. Minimally, these studies indicate that we should think about self-control like a resource, something that can be used up and replenished, something that can be depleted, tipping the scale toward violence.

One of the interesting implications of DeWall's work is that individual differences in glucose availability are coupled with individual differences in self-control. Diabetes shows a high level of heritability, meaning that some individuals are more likely to develop this problem than others simply based on what genes they receive from their parents. The prevalence of diabetes is on the rise in many countries, with some estimates suggesting that by 2025, there will be 325,000,000 diabetics world wide, more than double current estimates. The genetic disorder that lowers glucose levels arises because of a deficiency in a key enzyme, glucose-6-phosphate-dehydrogenase. This is one of the most common enzyme deficiencies in the world, affecting over 400,000,000 people, and in many cases, triggered by the consumption of fava beans. As with variation in the frequency of MAOA, so too can variation in this glucose-related gene be subject to selection pressures, especially given its link to violence. Once again, we see nature and nurture contributing to individual variation and cultural differences in our capacity to harm others.

Together, these observations of glucose-related disorders speak to a disconcerting reality: we are born with inherent differences in the availability of key resources guiding self-restraint. Some of us start off life better equipped to control our frustrations, wait for future gains, and moderate our temper. These early differences can have long lasting and disastrous effects later in life, a point supported by a study that began forty years ago with four year-old children presented with a marshmallow.

The American social psychologist Walter Mischel recruited four year old children to his laboratory and sat them down at a table with two objects: a marshmallow and a bell. He then told each

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child that he was going to leave the room. If they wanted to eat the marshmallow, they only had to ring the bell. But, as Mischel informed them, if they waited for his return, he would bring them more marshmallows. Mischel took out his stopwatch and recorded how long each child waited before ringing the bell.

Some children rang the bell almost immediately, leaving Mischel no time to leave the room. Others waited. This isn't surprising. Some children are impulsive, others are impatient, and this shows up early in life. What is surprising is that these early appearing personality types held steadfast, impacting later life decisions and actions. The more impatient types were more likely to be involved in juvenile delinquency, have poor grades, abuse drugs, get divorced, and lose their jobs. For women who developed eating disorders, those who were more patient were more likely to be anorexic, whereas those who were more impulsive were more likely to be bulimic. When the American developmental psychologist B.J. Casey put these now 40-somethings inside a brain scanner, the patient ones showed stronger activation in the prefrontal areas of the brain when viewing happy and fearful faces, revealing stronger self-control over their feelings. In contrast, when the impatient ones viewed the same stimuli, not only was there a weaker response in the prefrontal region but a stronger response in the ventral striatum when viewing happy faces. The striatum, as noted earlier, is involved in the experience of reward. For the impatient types, seeing something positive is like eating candy, something that is hard to ignore. The patient types regulate this feeling, transforming the heat of the moment into a cool experience. The impatient types are overwhelmed by this feeling, giving into temptation. This work adds to the genetic evidence reviewed earlier, showcasing both the importance of individual differences in self-control, and the stability of these differences as distinctive personality types.

Individual differences in self-control are also relevant to levels of recidivism in youths who have committed a crime, and thus tie us back to the beginning of this chapter and the costs of a career criminal. Career criminals are individuals who repeatedly commit crimes. They lack self-control. This is important for judges, juries and society as we want to know in advance who is most likely to commit another crime if we release them back out onto the streets. The American sociologist Matt DeLisi presented a self-control survey to approximately 800 juvenile youths, ages 12-17 years, each with a criminal record. Those who scored one standard deviation from the mean on this survey, and thus were more impulsive than most, were five times more likely to become career criminals. Five times. Self-control on its own accounted for about 80% of the variation in recidivism among these delinquents; the remaining 20% was accounted for by factors that one might think would be much more important, including mental health, education, gender, and socioeconomic background. As DeLisi concludes, these results suggest that measures of self-control provide a reliable predictor of the likelihood of repeating a crime. They provide a

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measure of risk, a factor that both juvenile and adult courts should be using to determine their sentencing, especially the individual's future dangerousness.

Individual differences in glucose metabolism, together with relative differences in brain activity, lead to stable differences in self-control. But there's more, both luck of the draw genetic effects and clinical distortions. Recall that the low expressing form of the MAOA gene results in lower levels of serotonin which, in turn, leverages less control over aggressive impulses. There is another gene — SLC6A4 — that also comes in two forms and regulates the level of serotonin. The short form of this gene gives you less serotonin, is commonly found in pathological gamblers and psychopaths — two heavily male-biased disorders that are associated with impoverished impulse control. Psychopaths also have relatively smaller frontal lobes , especially within a region that has a high density of serotonin neurons. Psychopathy is joined by a family of impulse control disorders that also implicate dysfunction of the serotonin system, including kleptomania (stealing), pyromania (burning), trichotillomania (hair pulling), and oniomania (shopping). Like glucose, serotonin plays a lead role in our capacity for self-control. When serotonin is sidelined from the performance, any number of impulsivity problems may emerge.

What I have said thus far is only a partial accounting of the biological ingredients that figure into our capacity for self-control. What this partial recipe tell us is that regardless of the situation, some individuals are inoculated against the pull of authority and group ideology and others are susceptible. If you missed the inoculation clinic in utero, you are more susceptible to temptations and excesses, including excessive violence. This is important for our interpretation of the real world and of the famous psychological experiments by Milgram, Zimbardo, and others in which seemingly good people carried out unambiguously horrid things. Some individuals carry a genetic skeleton that resists the push and pull of charismatic leaders and powerful isms. These people will not be pushed into doing bad things. Others, faced with the exact same situation, will find their skeleton buckling, tempted to take risks and lash out when the going gets tough.

Invisible risks

Several years ago, Ira Glass, the brilliant radio show host of *This American Life,* delved into the topic of superheroes. One episode focused on a question that has become part of my repertoire for dinner parties, especially those in need of a conversational catalyst: if you could become a superhero with one power, which would you take — the ability to fly or to be invisible? Most people have a rapid-fire, confident response to this question, while others reflect a bit, often engaging themselves in a public debate over their conflicted views. What is interesting about people's answer to this question, independently of whether they pick flying or invisibility, is that they rarely talk about using their power to do good in the

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world! The flyers talk about how cool it would be to vacation anywhere in the world, zip to work or school, or have fun soaring like an eagle. The invisibility types talk about sneaking into stores and taking clothes or music they like, eavesdropping on conversations, and playing tricks on family members and friends. What is even more interesting about these particular answers is how they divide into pure hedonism — flying — and pure vice — invisibility. With invisibility you can take risks at no cost, except for the cost that soon becomes apparent to many of these newly donned superheroes: even if they don't get caught, they still did something bad, morally bad. This ratchets up their guilt. With this realization, and a dip into the dark side, comes an about face, with some picking flying instead of invisibility. Rarely do people stick with invisibility, but see how they might deploy their power for virtuous purposes. Rarely do these superheroes realize that they can be real heroes, using their invisibility to gain covert information about terrorist organizations, elicit drug traders, pedophilic priests, or abusive parents — minus the risks.

In real life, there are risks associated with every decision, some clear from the start and others only clear in hindsight. As with self-control, a growing body of evidence shows that there are individual differences in risk-taking: some are risk-averse, some risk-prone, and some seemingly risk-blind, unaware that they are taking risks at all. Some of these differences are evident early in life. Some of these differences are strongly associated with crime later in life. Some of these differences provide insights into the invisible risks that individuals and societies confront, risks that can cause great harms.

Research on clinical populations with antisocial disorders, most notably those with a clinical diagnosis of psychopathy, reveals a major cause of their high risk, costly, and violent behavior: a failure to experience fear, anxiety, or stress in response to highly evocative images and sounds. In contrast with healthy populations, psychopaths are emotionally blasé about the things in the world that can cause harm or result in punishment. The problem lies in the fact that psychopaths, both adults and those identified as candidates early in childhood, fail to learn about the dangers in life. Their failure to learn is caused by a reduction in size and activity of two critical and connected brain areas: a region of the frontal cortex and the amygdala. When this system works efficiently, it allows individuals to learn about the sounds, smells, and sights that are associated with bad things in the world. When this system works well, individuals learn to avoid antisocial, immoral, and illegal acts by developing anxiety and fear over the possibility of punishment and personal injury. When this system works poorly, as is the case in psychopaths, individuals act as if there are no dangers or risks of punishment — a disposition that enables inappropriate actions. But psychopathy covers a broad spectrum, with problems that all of us confront at some point in our lives, some of us even repeatedly. This is important as it forces us to look at non-clinical populations for the causes of individual differences in risk-taking, especially our reactivity to dangerous events.

Studies carried out over several decades, in a wide variety of cultures, reveal that children begin life with distinctive temperaments. Some are mellow, blasé about events that are startling to many.

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Others are high strung and reactive, responding with heightened fear to the same startling events. Others fall somewhere in between these two poles. What is surprising is the fact those with the flattest response to evocative images and sounds are the most likely to become violent delinquents in young adulthood.

In a remarkable study, Adrian Raine and his colleagues presented 1,795 three year olds with two different sounds while recording the sweatiness of their palms; the sweatier the palms, the greater the stress and fear. One sound was always associated with a second and highly aversive noise, while the second sound was always played alone. When you pair a neutral sound, such as a pure tone, with a nasty sound, simply hearing the pure tone will make your skin crawl; the pure tone predicts what is coming, and what is coming is not pleasant. When Raine revisited these same individuals twenty years later, those with serious criminal records involving drug abuse, dangerous driving violations, or violence, had the driest palms at the age of three years. In another study, focusing specifically on violence, Raine measured the sweatiness of a different group of three year olds and then looked at their aggressiveness five years later. Once again, those with the driest palms at three years were the most aggressive at eight years. In the absence of a system that enables individuals to learn about danger, the brain and body act as if they were shrouded in an invisibility cloak, blind to the risks of crossing either moral or legal lines.

Raine's findings fit well with the marshmallow study. In the same way that those who were most impatient in the pre-school years were also most likely to exhibit signs of delinquency in early adulthood, so too were those who were most blasé about fearful stimuli as children most likely to exhibit delinquency in adulthood. Both studies reveal the stability of personality traits. Both studies suggest that at the level of groups of individuals, as opposed to specific individuals, the blasé-impatient types represent a greater threat to our welfare. The point about groups is important. These studies do not allow us to look at an individual's record and conclude that because he could only wait for 3 seconds before eating the lone marshmallow, and almost fell asleep when presented with loud banging noises, that he is without doubt headed for a life of crime. We also can't conclude that because patience and reactivity to fearful stimuli can be measured as early as three years old, that these personality traits are entirely genetic and fixed. In fact, other studies carried out by Raine show that if you ramp up the nutrition, exercise, and mental stimulation of children between the ages of 3-5 years, you can reduce adult criminal offenses by 35%. What we can conclude from these findings is that there are significant individual differences that affect who is willing to take risks and who isn't. We can conclude that there is a strong biological component that constrains the individual's options. We can conclude that those who start early in life without an understanding of the dangers in the world, act as if they live in a risk-free world. Molecular biologists provide an increasingly precise understanding of how these individual differences start, pointing to genes that bias some individuals to take extreme risks, including the risk of violating social norms and laws by violently attacking another human being.

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There are many situations where taking a risk pays off, whether we think of stealth military operations, chancy shots in the final seconds of a basketball game, or significant investments in an up and coming stock option. Playing it safe pays off. But those who stick their necks out and take a chance, may bring home significant gains. It is because of these competing strategies and potential payoffs that evolutionary biologists have imagined that selection could maintain both personality types within a population — a point noted earlier for the MAOA and glucose-related genes. If selection has worked in this way, then there must be genetic variation that allows for both strategies. To date, the strongest evidence comes from a family of genes associated with the regulation of dopamine, with the memorable acronyms of DAT1, DRD2 and DRD4; each of these genes is associated with different forms, each form associated with different levels of dopamine. Recall from chapter 2 that dopamine plays an essential role in our experience of reward, including how motivated we are to get it and what we anticipate based on our understanding of the situation — have we been rewarded in the past, how often, and how much? The idea here is that those who carry genes that output a higher level of dopamine may weight rewards more heavily and thus, show risk-blindness; for these individuals, the eye is on the prize, not the path or obstacles to this prize.

Across a number of studies, results show that variation in the expression of these genes is associated with high-risk, low self-control behaviors, including pathological gambling, substance abuse, sensation seeking, and financial investments. For example, in two separate studies, individuals with different variants of the DRD4 gene played a financial investment game involving real money. In one, designed by Joan Chiao, subjects decided to invest in either a risky asset with variable returns or a riskless asset with consistent returns. In the second study, the Swedish economist Ana Dreber and the American anthropologist Corin Apicella allowed subjects to either walk away with an initial starting pot of money, or to invest some of it in a risky asset. Those with the DRD4 variant that expresses higher levels of dopamine were more likely to pursue the risky investment. What this work reveals is that part of the variation we observe among people who make risky investments, drink too much alcohol, and gamble with their income, is due to variation in the dopamine family of genes. These are hidden risks that come to life thanks to molecular biologist's microscope. What also comes to life is the fact that these same genes are relevant to violence, causing some to strike out even though there are significant risks and terrible consequences.

In several studies, using an American health data base of several thousand adolescents, results consistently show a relationship between particular variants of the dopamine genes and violence. For example, the sociologist Guang Guo examined the relationship between violent delinquency — involving use of guns and knives — and variation in DRD2 and DAT1 among 2,5000 individuals ages 12-23 years. DRD2 was of particular interest because medical records and clinical trials reveal that administering

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haloperidol — a DRD2 dopamine antagonist — helps control aggression in psychotic patients. Guo found that levels of violence were about twice as high for one variant of the DRD2 gene than others, and about 20% higher for a particular variant of the DAT1 gene. These genetic variants cause differences in dopamine, which cause differences in expected and experienced reward, which cause differences in perceived risk, which cause differences in the odds of getting in a fight and harming others. These are not genes for aggression, violence or evil. There are no such genes. Rather, they are genes that change our perception of risk. Because risk is related to all sorts of decisions, these genes can affect the odds that we directly harm others. They are part of the story of individual differences, and part of the story of why some are more likely to engage in evildoing.

Everything I have discussed thus far focuses on actions, on how the psychology of desire and denial combine to fuel behaviors that lead, directly or indirectly, to excessive harms. I have also explained how different biological ingredients predispose us toward different degrees of self-control, and thus, differences in our ability to omit particular actions. This sense of omission is a virtue, a sign of resisting temptation. But can omissions be a sign of vice, of resisting an action that is called for? Can omissions ever reach such a scale that we would consider individuals or societies as evil omitters?

The sin of sloth.

What's worse: 1) giving a lethal overdose to someone suffering from an incurable disease or allowing this person to die by removing life support? 2) pushing someone in front of a runaway truck to stop the truck and save the lives of five others or allowing someone to walk in front of the truck instead of warning them? 3) pouring a toxic chemical into your competitor's drink in order to make him sick or allowing your competitor to drink the toxic chemical that was placed on the table by someone else? Even though all of these situations seem quite bad, most people have a gut feeling that the actions are worse than the omissions. They also feel that when we omit life support, fail to warn someone of a runaway truck, or remain silent about a toxic drink, that we are less responsible for the consequences that unfold. Dozens of studies, using hundreds of different examples, and thousands of subjects, support what our gut expresses: we are captive to an *omission effect*. Even when we understand that the consequences are precisely the same — the suffering patient dies, the truck kills the person, the toxic chemical makes the competitor sick — and so too are the person's goals and intentions — eliminate suffering, save five people, take out the competitor — we are seduced to believe that action is worse than omission or that doing harm to another is worse than allowing harm to occur.

The omission effect lays bare a tension between unconscious, spontaneous intuition and conscious, reflective thought. On the one hand, there are potentially good reasons why we evolved this

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intuition. It is a heuristic or rule of thumb that may be right much of the time. When I do something, as long as it is not by accident, my intentions and goals are more clear cut than when I fail to do something or allow it to happen. If I punch you and your arm bruises, the causality is clear: I caused your arm to bruise. I am responsible for this harm. I should be punished. If I stand by as someone is about to punch you, but don't deflect the punch when I easily could have, it feels odd to say that I caused your arm to bruise. It also seems strange to say that I am responsible and should be punished. By not deflecting the punch, I allowed the harm to occur. I could have prevented it from happening, but I am not obliged to. As social creatures, we have been designed to pick up on cues that reliably classify people into friends and enemies. Friends intentionally help us while enemies intentionally harm us. Actions showcase our intentions better than omissions.

The omission effect also makes sense in terms of personal responsibility. Not only do our guts tell us that actors are more responsible for outcomes than omitters, but our guts also tell us that it is hard to hold others responsible for their omissions. As I sit and write these words, I am committing heinous acts of omission: I am not currently giving money to any charities, am not scheduled to teach in the dozens of refugee camps around the world, and am not volunteering for any of the peace keeping armies sponsored by the UN. I am also guilty of many other minor crimes of omission, including the failure to consistently give my change to homeless individuals, and the failure to spend time in homes for the elderly and mentally handicapped. As I sit, I rack up countless harms of omission. It is hopefully the absurdity of this comment that shows why there is a fracture in the arm that connects omissions to responsibility. In a large scale society, it is impossible for us to hold people responsible for their omissions. There are far too many reasons, often good ones, why people *don't* act. The universe of reasons for acting is smaller.

If the omission effect arises because it is virtually impossible to hold omitters responsible in a large scale society, than what about small scale societies including the hunter-gathers of our past, and the tiny hamlets and villages that dot many countries, both developed and developing? When the number of people that you know and interact with is small, does the omission effect vanish? In a fish bowl community, you should be able to hold all of the other fish responsible for their actions and omissions because you know what they are up to. To explore this idea, the psychologist Linda Abarbanell and I ran a study with a rural, small scale Mayan population, living in the Chiapas region of Mexico. Every individual listened to a reading of a moral dilemma. Each dilemma described an action or an omission that resulted in harming one person, but saving the lives of many. Subjects judged the moral permissibility of the action or omission.

Unlike thousands of adults on the internet who judged similar dilemmas, as well as other Mayans living in a city, individuals in this small scale Mayan population perceived no moral difference between

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actions and omissions. The omission effect evaporated, with the moral weight of an action perceived to be on a par with an omission.

The Mayan study is but one example. It suggests some flexibility in our perception of actions and omissions, and shows how cultural differences can create individual differences. When our social world is relatively small and circumscribed, we can keep tabs on everyone. By keeping tabs, we can hold others responsible for their actions and their omissions. As the American psychologists Jon Haidt and Jonathan Baron have shown, this psychology can be recreated in the laboratory by creating scenarios in which the individuals are either unfamiliar or familiar. When there is a relationship between the individuals — family, friends, team members — and thus, some degree of familiarity, the omission effect weakens.

The omission effect is not an obligatory state of the human mind. It is a common tendency, a way that our brains lean, especially in unfamiliar contexts. In patients with obsessive compulsive disorder, the omission effect is as strong as it is in healthy subjects, *except* for familiar cases of harm that are directly relevant to them, such as the excessive washing behavior that is the trademark of this clinical disorder. The fact that certain situations can cause us to lean in different directions has important policy implications: even when corporations, institutions, or other organizations grow large, we should always segregate these masses into smaller divisions, and make the issues personally relevant. Every member of one division should hold all others within its division responsible or accountable. Further, efforts should be made to foster familiarity across divisions, enabling not only a level of responsibility but of respect and trust. By recreating the psychology of small scale societies, and making potential harms relevant, we may help bypass the omission effect, allowing us to hold people responsible for their omissions. This, in turn, may reduce the number of individuals who live as passive bystanders. Familiarity and relevance may well be the necessary catalysts for converting bystanders into active whistle blowers, defenders, and rescuers.

When bystanders remain passive, watching the world go by, it is often because they believe that their actions won't make a difference or think that the costs of heroism are too high. This is, again, an issue of responsibility. It raises the question of when we ought to act. The distinguished Australian philosopher Peter Singer has spent a lifetime pushing this issue in the context of charitable donations, culminating most recently in his book *The Life You Can Save*. The key idea, taken from a utilitarian perspective where outcomes as opposed to rules or principles motivate our moral actions, is that we ought to give a fraction of our incomes to those lacking basic access to food, shelter and health care. Standing by as bystanders when there are 1.4 billion people in a state of abject poverty is morally wrong. The logic seems perfectly reasonable, especially given the fact that humanitarian organizations have helped reduce the number of people living in poverty by .5 billion within the last 20 years. But then we learn of another Peter Singer idea: if the three richest men alive today — Carlos Slim Helu, Bill Gates, and Warren Buffett

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— worth a total of 153.5 billion dollars, were to give up one third of their net worth, they could solve world hunger. On a personal level, they would barely notice this donation. With this knowledge, why should I bother to give a penny? This is one example of apathy regarding our motivation to help others. What propels individuals to shift from passive bystanders who can allow harm to occur to active contributors?

Classic studies by the American psychologists John Darley and Bibb Latane reveal the ingredients for bystander action. Whether it is helping someone having a seizure, being molested, or in danger of suffocation from smoke, we are more likely to help when alone than when in a group. We are also more likely to help when we recognize the situation as a crisis and think that there are plausible solutions. These are all characteristics of the situation. There are also characteristics of the individual bystander, including their level of compassion and empathy toward others, their capacity to identify with the victim, and their self-control. For example, people who intervene in cases of child abuse, as opposed to the passive bystanders, are more likely to have been abused as children, more likely to perceive a solution, more likely to feel responsibility to intervene, and more likely to experience the weight of guilt for not intervening. We are back to individuals differences. We are back to the egg and coop, and their joint contribution to helping or harming others. We are back to the established genetic differences in compassion, risk-taking, and self-control that combine with a history of experience to create some who sit and watch and others who actively participate.

We are more likely to pardon bystanders because we tend to see omissions as less bad than actions, and omitters as less responsible for the consequences than actors. This is a dangerous effect. Bystanders are part of the equation of evil. As noted by the American genocide scholar and psychologist, Ervin Staub, bystanders start out as passive players on the side lines, but are rapidly transformed into perpetrators. The transformation starts with the challenge of maintaining passivity while watching other humans suffer; to maintain this observer status requires suppressing empathy for the sufferers, while recognizing that they are in the minority and you, the bystander, are with the majority. To avoid feeling guilty for not feeling empathy, bystanders distance themselves even further from the victims. Distancing is an adaptive response as any association with the victims could put a bystander in harm's way. But like so many other psychological states discussed in this book, distancing leads to dehumanization. Dehumanization leads to moral disengagement and greater justification for the perpetrators. Justification lends cheering support for violence. This is the final transforming step, from passive bystander to active participant.

Recall that on my account of evil, evildoers either have a desire to cause harm directly or desire something good, recognizing that it will cause harm indirectly. This is true of actions and omissions. For example, keeping a secret, even if pressured into spilling the beans, is a good thing because it upholds a

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promise, and thus, the relationship. But if keeping the secret results in innocent lives lost or ruined, then this is a bad thing. Not telling — an omission — indirectly can cause harm. This is the situation that has confronted the Catholic Church over the past twenty years.

During the tenures of Popes John Paul II and Benedict XVI, some 4,000 priests sexually abused some 10,000 innocent children. This is unquestionably an underestimate. This is excessive harm. Popes John Paul II and Benedict XVI , together with their cardinals and bishops, assumed the role of bystanders. They were aware of the rampant cases of child rape among the clergy. They could have acted. Their omissions are archetypal examples of the sin of sloth. By omission, they are responsible for excessive harm and should be held legally accountable. This process has begun as evidenced by the decision in October of 2011 to indict Bishop Robert Finn for failing to report a priest who took pornographic photographs of young girls. Though Finn was only charged with a misdemeanor, this case opens opens a legal floodgate. It is an opening that should allow prosecutors, around the globe, to indict bishops, cardinals, and the Pope for evil omissions. It should empower the parents and children who have suffered to rise up and demand justice for allowing excessive harm to occur. It should cause everyone to express outrage over the fact that allowing priests to rape innocent children perpetuates a cycle of pedophiles as those who have been abused are likely to abuse others. The leaders of the church have not only commited a crime of omission, but have helped perpetuate a culture of harm.

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Epilogue: Evilightenment

> Educate your children to self-control, to the habit of holding passion and prejudice and evil tendencies subject to an upright and reasoning will, and you have done much to abolish misery from their future and crimes from society.
> — Benjamin Franklin

Charles Darwin observed that of all the differences between humans and other animals, one capacity reigns supreme: we alone have the ability to contemplate what others *ought* to do. We alone are endowed with a moral imperative to reflect, consider, and imagine alternatives. We alone are impelled to be dissatisfied with the status quo, urged to contemplate what could be and ultimately what must be. This capacity creates a fundamental principle of human existence and enlightenment: we alone invest in the survival of the *least* fit. We give money to those in abject poverty, risk our lives to help others in areas of conflict, adopt abandoned children, nurture individuals with extreme disabilities, and care for the elderly. This principle fuels our humanitarian efforts. Sadly, it is a necessary response to another unique difference between humans and other animals: we alone have the ability to inflict great harms on our own species and many others. We alone are responsible for creating work for those in the humanitarian sector. We alone are evil.

We also have an opportunity to begin a new volume of humane history. We have the chance to harness our understanding of the past in order to present our children with the gift of knowledge and the prospects of a healthier future. We should — no, we must — teach our children what we have learned about the causes of corporate corruption, the desire for ethnic cleansing, and the combined forces of nature and nurture to create excessive suffering and lifeless flesh. These are topics that should be presented early on in education rather than waiting for heady discussions at the university. We owe the next generation the best education from our generation. The best education will come from confronting history, exposing human nature, and supporting cultural variation while fighting to demolish totalitarian regimes that limit or eliminate basic human rights. I write this sentence following on the eve of Egypt's inspiring revolution, a revolution led by educated people who refused to allow the dictator Hosni Mubarak to ruin their country and their children's future. The people of Egypt, like the people of many countries who rallied in the Arab spring of 2011, refused to be eternal victims. This is a lesson that must spread to every corner of the globe. It is a lesson of hope. It is a lesson to all evildoers to beware.

I have taken you on a journey into evil's core, penetrating with scientific evidence and explanation. Though we have traveled to distant lands, traversed vast spans of time, and encountered wildly different cultures, the key idea is that this richness was generated from a few essential ingredients. This is a minimalist approach to a difficult and highly variegated problem. I end our journey by taking stock of the essential ideas and reflect on some of the broader implications.

Retracing our steps

In the beginning, before there were bald, bipedal, big-brained, babbling humans, there were hairy, quadrupedal, bitsy-brained, barking bonobos. These animals, clearly clever, have survived for over 6-7 million years, despite attempts by our species to demolish their habitat. But — and this is a significant

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but — in the millions of years that encompass their evolutionary history, bonobos have remained virtually unchanged. They are still hairy, quadrupedal, bitsy-brained and barking. They still live in the jungles of Africa. Not a single bonobo, or its close relative the chimpanzee, has ever taken a step out of Africa the way that members of our species did some 60-100,000 years ago. In fact, not a single bonobo or chimpanzee has ever ventured across national borders within the continent to explore new opportunities or develop new cultures. Not a single bonobo or chimpanzee has even moved out of the forests and on to the beaches or deserts or alpine environments of Africa. Not one. When we took our steps out of Africa, we did so with confidence, ready to tackle new environments, create novel tools, engage in rituals to commemorate the dead, build fires to cook food and keep warm, join hands with unrelated strangers in the service of cooperation, and create oral histories that could be passed on to generations of children. What enabled this celebratory migration was a cerebral migration. Not only did our brain get much bigger than the one housed within bonobo and chimpanzee skulls, it evolved into an engine that generates an unlimited combination of thoughts and feelings. We uniquely evolved a promiscuous brain.

What does promiscuity buy? In a word: "creativity." It enables regions of the brain that evolved for highly specialized functions to intermingle with other regions of the brain to create new ways of thinking and new ways of experiencing what we see, hear, touch, taste and feel. A promiscuous brain paved the way for awe-inspiring bursts of creativity in art, music, literature and science. A promiscuous brain enabled Bach and Bono, Picasso and Pollock, Shakespeare and Shaw, and Descartes and Darwin. A promiscuous brain enables us to imagine things we have never directly experienced, to create once unimaginable worlds, including blissful heavens and living hells. My focus in this book has been the infernos we create for other human beings, here on this earth. What I have argued is that we got here by accident.

When our brains allowed us to combine familiar thoughts and feelings to create virgin ideas, it enabled us to feel good about doing bad. It enabled us to incur the costs of punishing others while reaping the rewards of marching to the moral high ground. It enabled us to solve the problem of large scale cooperation with unrelated strangers. This was a fundamental breakthrough in mental life, a spectacular benefit, and the target of strong selection. But benefits often carry hidden costs. When punishment triggered a honey hit to the brain, violence and reward formed an eternal bond. We now carry the burden of a brain that engages in denial in order to satisfy our desires. When these concepts couple, the odds of conceiving excessive harms is virtually guaranteed. Sometimes this malicious offspring is intended and at other times it is foreseen. Either way, the world has been populated with evildoers in waiting. Either way, our world hosts a species that has the creative capacity to financially ruin, mutilate, rape, burn, torture, and extinguish millions of lives. Often, this potential is realized.

My aim in this book has been to explain evil to better understand its origins, not to justify or promote it. My aim has been to explain evil to clarify its root cause, to alert others to its early warning signs, and to pave the way to a more humane existence. I have suggested that evil, expressed in the form of excessive harms, is caused by two ingredients: desire and denial. These are psychological states. On their own, they are often inert. When combined, they are often explosive.

Desires. We all have them, from birth till death, from a desire for perpetual maternal warmth to a desire for eternal life. Some of our desires change over the course of our lives while others stay the same. We all desire good health and happiness. We differ, however, in what counts as good health and happiness. Many of us experience, at least once in our life, the desire to harm another. Our desire to harm ranges from the mundane — uttering a sarcastic comment about someone's looks or telling a racist joke — to the horrific — creating corrupt corporate schemes or policies of ethnic cleansing. Sometimes what we desire is rather benign, but linked to foreseeable atrocities. Sometimes our desires are toxic, as when we plot to extinguish a culturally distinctive group. On one reading, President George W. Bush may well have initiated the wars in Afghanistan and Iraq as retaliatory attacks on terrorists, designed to protect American interests and well-being. But he brought much of our nation on board by weaving a web of lies and feeding a cowboy mentality of revenge rather than nurturing compassion and understanding. The consequences, clearly foreseen at the time, have been excessive. As a nation, we did not pursue an eye-for-an-eye revenge. We had a different algorithm in mind, on the order of 30,000 eyes for an eye.

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Approximately 3,000 innocent victims died in the 9-11 attacks. As of early 2011, some where between 900,000 to over a million soldiers and civilians have died in Afghanistan and Iraq due to the war. This is excessive. This is no longer revenge. This is senseless brutality.

On one reading, Pope Benedict XVI kept his knowledge of pedophilic priests quiet and confidential in order to forgive them and protect the church. But this seemingly benign desire led to a disaster, one that was foreseeable: continued sexual assault on thousands of innocent children and for many, a loss of trust in the church and their moral and spiritual leader.

Discoveries by molecular biologists, neuroscientists, and psychologists reveal important individual differences in our capacity to fuel desire, differences that constrain the paths we take from birth until our last breath. Some individuals are more risk-prone, some are impatient, and some gain a greater hit of dopamine in anticipation of reward, thereby doping themselves on the brain's pharmaceutical offerings. Some are born with a set of genes that diminish the capacity for self-control. These individuals start with lower levels of serotonin. These individuals, if raised by abusive parents, have a higher probability of taking someone's head off if they are challenged. Some individuals are born with low stress levels. These individuals are more likely to be sensation-seekers, voracious desirers who will stop at nothing less than the spectacular, even if this means the spectacularly violent. None of these biological catalysts operate in a vacuum. All of these biological catalysts feed off of particular environments that we create. Geological and climatic factors create savannahs, oceans, and mountains. We create slums, refugee camps, and totalitarian regimes. We are responsible for creating toxic environments and equally responsible for cleaning them up. How we think about individual responsibility in cases of brain damage, developmental disorders or innate differences in the starting state of our neurochemistry is a different problem, one that I will touch upon in the last section.

Denial. We all engage in it, at least some of the time. Like the psychology of desire, our engagement with denial is sometimes benign and often beneficial as a coping mechanism. We dehumanize in order to buffer ourselves from the pain of another's pain. We self-deceive in the service of boosting self-confidence and self-esteem. When doctors turn their patients into machines that require repair, they have deployed an adaptive mechanism that keeps empathy at bay when it is unnecessary. Good doctors, the ones that we all want, turn empathy back on when their patients awake from surgery, flesh and blood pulsating, thoughts and emotions humming. Bad doctors never turn empathy back on. Evil doctors, such as Carl Clauberg who injected liquid acid in the uterus of Jewish prisoners as part of a Nazi inspired sterilization program, not only lack empathy for their patients, but see them as vermin or parasites that require extermination in the name of science and the preservation of our species. Denial has transformed other human beings into nonhuman forms, from inert objects to wild animals and parasites. Denial has allowed military leaders and airplane pilots to ignore clear signs of trouble, marching thousands to their death. When this happens, moral responsibility checks out. Denial provides individuals and nations with a certified license to maim, rape, burn, mutilate and kill without feeling guilt, shame or remorse.

As with desire, the sciences provide a rich offering of evidence to explain how and why we engage in denial, either by means of dehumanizing others or self-deceiving ourselves. Both dehumanization and self-deception have a clear evolutionary logic. Dehumanization is a mechanism that enhances an individual's competitive edge by making hatred and killing easier. Hatred and killing are the essential and ancient ingredients for defending the in-group and effacing the out-group. Sometimes, soldiers would rather avoid killing the enemy. But when dehumanization of the enemy takes hold in the mind of a soldier or civilian, killing is not only easy, but addictive. The brain's inhibitory mechanisms, processed by circuitry in the frontal lobes, shut down. Other brain regions involved in working out what people believe and intend, enter into hibernation. With these circuits on leave, so too is our moral conscience. When the mind runs its dehumanization software, abstinence from killing is like withdrawal from a drug. Killing is satisfying. Killing is delicious.

Self-deception evolved in the service of deception. By functionally fooling ourselves into believing that we are stronger, wiser, and more competent, we can convince others to go along for the ride, to work for us or work against a fictional enemy. Like dehumanization, this has both adaptive and

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maladaptive consequences. Brain imaging studies show that different circuits turn on when we lie about long held personal stories as opposed to lies about in-the-moment situations. When we distort reality, either omitting information or twisting it to create a false belief, we have to inhibit the way things are to create an illusion of the way we wish them to be. In each case, there is conflict between one version of reality and another. In each case, the electrical and chemical choreography of the brain recruits its braking mechanism, stifling one piece of knowledge in the service of lifting another to the surface of our lips. We perfect this capacity over the course of development. Some are born lacking this capacity. Others have a system that is out of control, unable to distinguish truths from falsehoods. Somewhere along this spectrum are healthy members of society who have the potential to justify themselves and a society of willing listeners about the importance of becoming willing executioners, a phrase coined by the historian Daniel Goldhagen to describe Germans involved in the Holocaust.

Desire + Denial. We all carry out this sum easily, often automatically and unconsciously. When we are pushed by a desire to eliminate others or to achieve some other goal, we call on denial to justify both extraordinary means and exceptional ends. We convince ourselves that we are morally in the right and that extermination or manipulation are our only options. We convince ourselves that the other is an object or animal, emotionally inert or unrecognizable. We shrink our moral circle, creating a culture of indifference. We convince ourselves through self-deception that the other is a threat. When we feel threatened, we raise our hackles in self-defense. When self-defense steps forward it recruits violence, justified by the belief that fighting back is not only right, but obligatory. Once violence starts, supported by a moral imperative, uncontrollable escalation follows, leaving a trail of dead bodies, raped women, and abducted children. Desire couples with denial. Once this liaisons forms, it evolves, grows and feeds on itself. We have arrived at excessive harms. We have arrived at evil.

What can we do? How can we harness our understanding of evil to predict when it might occur again? Can we reduce future danger?

Future dangerousness

Why do we allow 16 year olds to drive in many parts of the United States, but prevent them from drinking alcohol until 21 and from renting a car until 25? Why must the President of the United States be at least 35 years old, but members of the House of Representatives can enter at 25? If 16 is the magic number for driving, why isn't it also the magic number for drinking, voting, becoming president, marrying without parental consent, joining the military, and being executed for a felony murder? Or why not make 21 the magic age for all age-restricted behaviors and positions? This would make sense in terms of our biology: it is precisely around the age of 21 that our frontal lobes have matured more completely, thereby providing us with a more functional engine for self-control. Or, why not question why we have a legal age at all? Why not have a brain scan for frontal lobe maturation along with a test for self-control that would allow some pre-16 year olds to drive, but might prevent some post-21 year olds from drinking? And if you are in favor of the death penalty — I'm not — than why not detach it from age altogether and look at the individual's moral competence and capacity for self-control?

These are hard questions. How we answer them will have resounding implications for law and society. When a legal system decides that someone can drive, drink, vote, kill, run for president, marry, and die as a penalty for crime, it has constrained human behavior based on a statistical evaluation of psychological capacity. In each case, our assignment of age-appropriateness indicates that we believe the person is responsible for his or her actions and thus, his or her future actions. It also indicates that those under age are not responsible for their actions. We grant permission to drive at 16 years of age because we believe that *most* 16 years olds are capable of driving responsibly, now and in the future. We believe that a person who committed a heinous crime at the age of 18 is responsible for harming others and is likely to do so in the future. He or she is thus eligible for the death penalty, at least in some states within the United States. In contrast, we believe that someone at the age of 17 is still developing and has the potential to change. In this sense, we hold them less responsible for their actions.

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Looking out at the tapestry of age-limited situations reveals a rather eclectic pastiche. In many of these cases, the cut-off age seems both arbitrary and inappropriate given the statistics. Consider the legal driving age. Is it the case that 16 year olds are responsible drivers? 16 years olds have higher crash rates than any other age group in the United States, are more likely to die in a car crash than the average of all other age groups, and car crashes are the leading cause of death among 16 year olds. North Dakotans believe that 14 year olds can drive a car. They may have fewer drivers on the road, but that doesn't mean that a 14 year old won't hit them or drive off the road after irresponsibly drinking. Why not keep all youths off the road until 21 when the statistics on fatal car crashes drop? Or why not follow the lead of car rental agencies and wait for the 25th birthday?

There are at least two common answers to the driving age problem, both utilitarian: in farming communities, and other environments where children work with their parents, it is essential to have children driving as soon as possible; and throughout the country, many parents look forward to the day when their children can drive, thereby alleviating the need for their private chauffeur service. There is no question that these are benefits. But if the cost is death to the child and others, the economics just don't work out. One option would be to lower the legal driving age for those communities or situations in which parents demonstrate the significance of young children driving for their financial security and well being. Those without this justification must wait until they are 21, frontal lobes matured and the novelty of intoxication lowered.

The most interesting and relevant age-related issue is when someone is treated as an adult as opposed to a juvenile criminal. Within the United States, most states set the bar at 18 years, but some as young as 16. Where a state sets its bar determines whether or not the individual is eligible for the death penalty or a life sentence, as well as a host of social services. Many states with the bar currently set below 18, including my own state of Massachusetts, are presently debating whether the age limit should be raised. For some, the issue is simply one of parity: this is not an issue where states should differ, and thus everyone should be with the majority at 18 years. Others add to this discussion by arguing that it should be 18 because of brain maturation. Although it is absolutely the case that a more mature brain brings with it better self-control and less sensation-seeking or risk-taking, there is no evidence of a reliable difference between 16, 17 and 18 year olds. Some 16 year olds are remarkably patient and risk-averse whereas some 18 years olds are remarkably impulsive and risk-prone. If this is to be a meaningful discussion about future risks, plasticity, and the opportunity for rehabilitation, it will have to grapple with the scientific evidence that is presently on offer.

When we use age to distinguish between legally permissible and forbidden actions, we have acknowledged that our biology and upbringing represent mitigating factors. We believe that juvenile crimes are forgivable and their actions correctable. In fact, their crimes are forgivable because their actions are correctable. Once we admit nature and nurture into the legal calculus concerning our youths, we must also allow such factors to guide our decisions about adults with developmental disorders, brain damage, and different genetic make-up. Yet, the law seems to have a double standard: youths lack free will, whereas adults have it, even if it is somewhat diminished. But if we believe that juveniles lack a sufficiently mature capacity for self-control, planning and thinking about alternative options, then we must recognize that fully mature adults can lose these capacities as they naturally age, and can lose them at any age if they suffer from brain damage. We must also wrestle with the fact that some people are born with a genetic constitution that makes them more vulnerable to addictions, sensation-seeking, violence, and a lack of compassion. Perhaps they too should be banned from driving, voting, drinking, marrying and military combat. When do we look at the excessive harms caused by individuals or groups and hold them responsible? When do we punish them to pay for their crimes and fend off future atrocities?

The law often invokes the notion of future dangerousness as a means of evaluating risk. So too does the public and media. The general presumption is that for certain kinds of offences, there is a predictably high level of recidivism, of doing the same thing over and over again. But the implication of this judgment is that those who are deemed guilty are, in some way, not responsible for their future. Their future is determined for them. In fact, it is so determined that the law is willing to make a confident wager and send these criminals to prison or to their death. On this view, someone who has already

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repeated a crime is more likely to repeat than someone who has only committed a crime once. On this view, those who engage in certain kinds of crimes, such as child molesters and rapists, are more likely to repeat because it is "in" their system. Unfortunately, both folk perception and legal analysis of future dangerousness are based on weak evidence, unfounded assumptions, or both.

Consider sexual offenders. Their crime is intentional, frequently repeated, and aimed at innocent victims. Given that many sexual offenders repeat their offenses, it has the appearance of inevitability, of a process that is highly determined. Because many sexual offenders were abused as children, some experts conclude that we should blame their parents. Other experts believe that particular situations either promote or support sexual offenders, including the church and medical exam rooms. And yet other experts, including the psychiatrist Boris Schiffer, reveal brain differences among pedophiles, including especially the areas involved in reward and self-control. Together, these observations suggest that the combination of a deviant nature and toxic nurture have led to a more deterministic universe. In this universe, sexual offenses are inevitable or so highly probable that we should lock up offenders and post their crimes in every county's registry, and if possible, as replacements for flamingo lawn art.

If this assessment of sexual offenders is right, how should we think about responsibility, blame, and punishment. If sexual offenders can't help themselves, how should we assign blame? How should we assign an appropriate level and form of punishment, if punishment is even appropriate? Studies of recidivism among sexual offenders generate rates as low as 15% and as high as 80%. These studies also reveal that recidivism rates differ for incest perpetrators, rapists, and child molesters. These numbers tell us that even child molesters don't always repeat their crimes. They also tell us that sexual offences should not be lumped, but split apart into their underlying causes and triggers. Like the high odds favoring a horse with a distinguished lineage and top rated jockey, there are high odds favoring repeated sexual molestation in an individual who was sexually abused as a child and enters the clergy. Does this mean that we should all bet on this one horse or forget the race altogether? Does this mean that we should lock up the priest before he has an opportunity to enter his parish? No and No. Neither horse racing nor sexual molestation are that easily determined. Future success and future dangerousness are probabilistic. They represent our best guesses. When the law determines that someone is at high risk of committing a future offense, it doesn't really care whether the individual is perfectly healthy or brain damaged. It cares about risk. In terms of blame and punishment, however, the law cares about the perpetrator's brain. The law cares about a person's capacity to act rationally and independently. It is this capacity that allows us to assign responsibility. It is this capacity that drives many theories of blame and punishment, including the Australian legal scholar Michael Moore's massive treatise *Placing Blame*. These are reasons why scientific understanding of future dangerousness is important for law and society.

Armed with these ideas about future dangerousness, we can return to the list of potential evildoers that I mentioned in the prologue. This list included individuals who caused relatively minor harms such as Reverend Lawrence Murphy and Charles Manson, as well as those who committed much more major harms such as Idi Amin and Mao Zedong. Whether we consider these individuals and their acts as evil is orthogonal to the fact that each one posed a great risk to society. Each of these individuals would have been judged as high risk for causing future danger. Only some of these individuals should have been punished if punishment is guided by our understanding of responsibility and blame. Only those individuals who can take responsibility for their actions and change should be punished. On this view, all of the dictators were rightly blamed and punished. And so too were Jane Toppan, Bernard Madoff, and Charles Granger. In contrast, although Lawrence Murphy should have been locked up as opposed to exiled to a cottage, both Murphy and Charles Manson are more difficult to assess in terms of responsibility, and thus, the appropriateness of punishment. No one would want them walking the streets today, free to rape innocent children or create a cult of murderers. But for the law to evolve, we need better tools to evaluate the biological underpinnings of diminished capacity. These measures, still in the early stages of development, will help refine our understanding of risk, guide our clinical interventions, and contribute to the construction of a safer society.

As we move forward, we must also recognize the rapidly changing landscape, and the future dangerousness of globalization, especially its capacity to breed evildoers. Like authority, conformity,

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dehumanization, and self-deception which each have both beneficial and toxic personalities, so too does globalization. Globalization has integrated developing countries into the global economy and allowed them to profit from new resources and advances. But globalization has also fragmented these countries by giving them access to resources that corrupt, such as arms for guerrilla leaders and rogue armies. What has changed in the twenty-first century, perhaps as early as the 1990s, is a new form of war, one that is tied to the signature of evil and its expression as excessive harm. No longer are wars confined to state borders, restricted to states and their legitimized militaries, financed by governments and tax revenues, and focused on combatants. Instead, the new wars of the twenty-first century have entirely porous boundaries, are funded by private organizations, run by grass-root groups, and motivated by the use of horrific means to achieve equally horrific ends, including torture, rape, mutilation, and the use and abuse of civilians, women, children and men alike. As a result, international law is effectively, ineffective. Those running these new wars are outside of international law.

The consequence of the new wars extends beyond the travesties experienced by those living in these hot spots to the humanitarian aid workers and journalists who attempt to help the victims. Humanitarian aid is often pirated by rogue militias, and journalists are frequently killed or badly injured. We must therefore face the sad reality that as we ended the twentieth-century and initiated the twenty-first, casualties to non-combatant civilians shifted from few to many. We must face the reality that combating evil will require new laws and new protections for those who risk their lives to aid victims and give voice to their often silent suffering.

Evil ever after?

We won't eradicate evil. Why? Because the capacity for evil is rooted in human nature, born of a promiscuous mind that enables ideas and feelings to flip between beneficial and toxic. Though we institute programs and practices that promote the beneficial, living within every human mind is a toxic neighbor, waiting to move in. Adhering to authorities is beneficial in that great leaders are energizing, empowering, creative, and a source of guidance into a brighter future. But even great leaders can turn toxic, imposing corrosive ideologies and eliminating basic human rights. Conformity is beneficial in that we want to live in a society where norms are followed, providing stability and cooperation. But conformity is toxic when it leads to blind faith and uncritical thinking. Dehumanization is beneficial in allowing us to carry out medical procedures and live with certain kinds of human suffering. But dehumanization is toxic when it facilitates ethnic cleansing by shrinking the moral circle, turning atrocities into virtuous offerings. Tolerance and pluralism are beneficial in that they lead to respect and concern for others' attitudes and desires. But tolerance and pluralism are toxic when they breed apathy and a willingness to stand by as passive bystanders.

My diagnosis of evil is not meant to be defeatist, but realist. It is only through an acknowledgment of our biology and the environments it has created — and can create — that we can look for solutions to ameliorate the human condition. We are all vulnerable to walking on the wrong side. We are fallible. We are also enormously creative, capable of great change. Like no other species, we relentlessly seek novelty. No one wants to be like his or her predecessor. Whether it is a new culinary tradition, extreme sport, technological innovation, musical genre, or weapon of destruction, our search for novelty is an indestructible component of human nature.

Our journey into the nature of evil has come to an end. Bombarded by the sheer magnitude of lives lost or damaged beyond repair, it is natural to deaden our senses and choke our feelings in the hope of finding solitude and peace. As painful as a re-awakening is, we must remember the individuals that make up these massive atrocities. Reflecting upon the loss of his son who was murdered by the Lord's Resistance Army, an 80 year old Ugandan chief summed it up — "We have been forgotten. It's as if we don't exist."

We must never forget. We must never deny our potential to cause horrific pain and suffering while finding ways to forgive and express deep compassion. We must never give up on humanity.

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Endnotes: Epilogue

Recommended Books:

Glover, J. (2000). *Humanity.* Yale University Press.
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Moore, M.S. (2010). *Placing Blame.* Oxford University Press.

Quotes:

• Human Rights Watch Report, 2010, "The Trail of Death"

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From: Tonja Haddad Coleman [[redacted]
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To: Jeffrey Epstein [jeevacation@gmail.com]; Darren Indyke [[redacted]]; Debbie Fein [[redacted]]; [redacted] -

Importance: High

Farmer Jaffe is suing Donald Trump!

http://www.mypalmbeachpost.com/news/business/lawsuit-lobbed-against-trumps-ownership-of-former-/nXjjQ/?icmp=pbp_internallink_invitationbox_apr2013_pbpstubtomypbp_launch

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Ben Goertzel with Cassio Pennachin & Nil Geisweiller &
the OpenCog Team

Engineering General Intelligence, Part 1:

A Path to Advanced AGI via Embodied Learning and Cognitive Synergy

September 19, 2013

This book is dedicated by Ben Goertzel to his beloved, departed grandfather, Leo Zwell – an amazingly warm-hearted, giving human being who was also a deep thinker and excellent scientist, who got Ben started on the path of science. As a careful experimentalist, Leo would have been properly skeptical of the big hypotheses made here – but he would have been eager to see them put to the test!

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Preface

This is a large, two-part book with an even larger goal: To outline a practical approach to engineering software systems with general intelligence at the human level and ultimately beyond. Machines with flexible problem-solving ability, open-ended learning capability, creativity and eventually, their own kind of genius.

Part 1, this volume, reviews various critical conceptual issues related to the nature of intelligence and mind. It then sketches the broad outlines of a novel, integrative architecture for Artificial General Intelligence (AGI) called CogPrime ... and describes an approach for giving a young AGI system (CogPrime or otherwise) appropriate experience, so that it can develop its own smarts, creativity and wisdom through its own experience. Along the way a formal theory of general intelligence is sketched, and a broad roadmap leading from here to human-level artificial intelligence. Hints are also given regarding how to eventually, potentially create machines advancing beyond human level – including some frankly futuristic speculations about strongly self-modifying AGI architectures with flexibility far exceeding that of the human brain.

Part 2 then digs far deeper into the details of CogPrime's multiple structures, processes and functions, culminating in a general argument as to why we believe CogPrime will be able to achieve general intelligence at the level of the smartest humans (and potentially greater), and a detailed discussion of how a CogPrime-powered virtual agent or robot would handle some simple practical tasks such as social play with blocks in a preschool context. It first describes the CogPrime software architecture and knowledge representation in detail; then reviews the cognitive cycle via which CogPrime perceives and acts in the world and reflects on itself; and next turns to various forms of learning: procedural, declarative (e.g. inference), simulative and integrative. Methods of enabling natural language functionality in CogPrime are then discussed; and then the volume concludes with a chapter summarizing the argument that CogPrime can lead to human-level (and eventually perhaps greater) AGI, and a chapter giving a thought experiment describing the internal dynamics via which a completed CogPrime system might solve the problem of obeying the request "Build me something with blocks that I haven't seen before."

The chapters here are written to be read in linear order – and if consumed thus, they tell a coherent story about how to get from here to advanced AGI. However, the impatient reader may be forgiven for proceeding a bit nonlinearly. An alternate reading path for the impatient reader would be to start with the first few chapters of Part 1, then skim the final two chapters of Part 2, and then return to reading in linear order. The final two chapters of Part 2 give a broad overview of why we think the CogPrime design will work, in a way that depends on the technical

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details of the previous chapters, but (we believe) not so sensitively as to be incomprehensible without them.

This is admittedly an unusual sort of book, mixing demonstrated conclusions with unproved conjectures in a complex way, all oriented toward an extraordinarily ambitious goal. Further, the chapters are somewhat variant in their levels of detail – some very nitty-gritty, some more high level, with much of the variation due to how much concrete work has been done on the topic of the chapter at time of writing. However, it is important to understand that the ideas presented here are not mere armchair speculation – they are currently being used as the basis for an open-source software project called OpenCog, which is being worked on by software developers around the world. Right now OpenCog embodies only a percentage of the overall CogPrime design as described here. But if OpenCog continues to attract sufficient funding or volunteer interest, then the ideas presented in these volumes will be validated or refuted via practice. (As a related note: here and there in this book, we will refer to the "current" CogPrime implementation (in the OpenCog framework); in all cases this refers to OpenCog as of late 2013.)

To state one believes one knows a workable path to creating a human-level (and potentially greater) general intelligence is to make a dramatic statement, given the conventional way of thinking about the topic in the contemporary scientific community. However, we feel that once a little more time has passed, the topic will lose its drama (if not its interest and importance), and it will be widely accepted that there are *many* ways to create intelligent machines – some simpler and some more complicated; some more brain-like or human-like and some less so; some more efficient and some more wasteful of resources; etc. We have little doubt that, from the perspective of AGI science 50 or 100 years hence (and probably even 10-20 years hence), the specific designs presented here will seem awkward, messy, inefficient and circuitous in various respects. But that is how science and engineering progress. Given the current state of knowledge and understanding, having *any* concrete, comprehensive design and plan for creating AGI is a significant step forward; and it is in this spirit that we present here our thinking about the CogPrime architecture and the nature of general intelligence.

In the words of Sir Edmund Hillary, the first to scale Everest: "Nothing Venture, Nothing Win."

Prehistory of the Book

The writing of this book began in earnest in 2001, at which point it was informally referred to as "The Novamente Book." The original "Novamente Book" manuscript ultimately got too big for its own britches, and subdivided into a number of different works – *The Hidden Pattern* [Goe06a], a philosophy of mind book published in 2006; *Probabilistic Logic Networks* [GIGH08], a more technical work published in 2008; *Real World Reasoning* [GGC+11], a sequel to *Probabilistic Logic Networks* published in 2011; and the two parts of this book.

The ideas described in this book have been the collaborative creation of multiple overlapping communities of people over a long period of time. The vast bulk of the writing here was done by Ben Goertzel; but Cassio Pennachin and Nil Geisweiller made sufficient writing, thinking and editing contributions over the years to more than merit their inclusion of co-authors. Further, many of the chapters here have co-authors beyond the three main co-authors of the book; and

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the set of chapter co-authors does not exhaust the set of significant contributors to the ideas presented.

The core concepts of the CogPrime design and the underlying theory were conceived by Ben Goertzel in the period 1995-1996 when he was a Research Fellow at the University of Western Australia; but those early ideas have been elaborated and improved by many more people than can be listed here (as well as by Ben's ongoing thinking and research). The collaborative design process ultimately resulting in CogPrime started in 1997 when Intelligenesis Corp. was formed – the Webmind AI Engine created in Intelligenesis's research group during 1997-2001 was the predecessor to the Novamente Cognition Engine created at Novamente LLC during 2001-2008, which was the predecessor to CogPrime.

Acknowledgements

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Chapter 1
Introduction

1.1 AI Returns to Its Roots

Our goal in this book is straightforward, albeit ambitious: to present a conceptual and technical design for a thinking machine, a software program capable of the same qualitative sort of general intelligence as human beings. It's not certain exactly how far the design outlined here will be able to take us, but it seems plausible that once fully implemented, tuned and tested, it will be able to achieve general intelligence at the human level and in some respects beyond.

Our ultimate aim is Artificial General Intelligence construed in the broadest sense, including artificial creativity and artificial genius. We feel it is important to emphasize the extremely broad potential of Artificial General Intelligence systems. The human brain is not built to be modified, except via the slow process of evolution. Engineered AGI systems, built according to designs like the one outlined here, will be much more susceptible to rapid improvement from their initial state. It seems reasonable to us to expect that, relatively shortly after achieving the first roughly human-level AGI system, AGI systems with various sorts of beyond-human-level capabilities will be achieved.

Though these long-term goals are core to our motivations, we will spend much of our time here explaining how we think we can make AGI systems do relatively simple things, like the things human children do in preschool. The penultimate chapter of (Part 2 of) the book describes a thought-experiment involving a robot playing with blocks, responding to the request "Build me something I haven't seen before." We believe that preschool creativity contains the seeds of, and the core structures and dynamics underlying, adult human level genius ... and new, as yet unforeseen forms of artificial innovation.

Much of the book focuses on a specific AGI architecture, which we call CogPrime, and which is currently in the midst of implementation using the OpenCog software framework. CogPrime is large and complex and embodies a host of specific decisions regarding the various aspects of intelligence. We don't view CogPrime as the unique path to advanced AGI, nor as the ultimate end-all of AGI research. We feel confident there are multiple possible paths to advanced AGI, and that in following any of these paths, multiple theoretical and practical lessons will be learned, leading to modifications of the ideas possessed while along the early stages of the path. But our goal here is to articulate **one** path that we believe makes sense to follow, one overall design that we believe can work.

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1.2 AGI versus Narrow AI

An outsider to the AI field might think this sort of book commonplace in the research literature, but insiders know that's far from the truth. The field of Artificial Intelligence (AI) was founded in the mid 1950s with the aim of constructing "thinking machines" - that is, computer systems with human-like general intelligence, including humanoid robots that not only look but act and think with intelligence equal to and ultimately greater than human beings. But in the intervening years, the field has drifted far from its ambitious roots, and this book represents part of a movement aimed at restoring the initial goals of the AI field, but in a manner powered by new tools and new ideas far beyond those available half a century ago.

After the first generation of AI researchers found the task of creating human-level AGI very difficult given the technology of their time, the AI field shifted focus toward what Ray Kurzweil has called "narrow AI" – the understanding of particular specialized aspects of intelligence; and the creation of AI systems displaying intelligence regarding specific tasks in relatively narrow domains. In recent years, however, the situation has been changing. More and more researchers have recognized the necessity – and feasibility – of returning to the original goals of the field.

In the decades since the 1950s, cognitive science and neuroscience have taught us a lot about what a cognitive architecture needs to look like to support roughly human-like general intelligence. Computer hardware has advanced to the point where we can build distributed systems containing large amounts of RAM and large numbers of processors, carrying out complex tasks in real time. The AI field has spawned a host of ingenious algorithms and data structures, which have been successfully deployed for a huge variety of purposes.

Due to all this progress, increasingly, there has been a call for a transition from the current focus on highly specialized "narrow AI" problem solving systems, back to confronting the more difficult issues of "human level intelligence" and more broadly "artificial general intelligence (AGI)." Recent years have seen a growing number of special sessions, workshops and conferences devoted specifically to AGI, including the annual BICA (Biologically Inspired Cognitive Architectures) AAAI Symposium, and the international AGI conference series (one in 2006, and annual since 2008). And, even more exciting, as reviewed in Chapter 4, there are a number of contemporary projects focused directly and explicitly on AGI (sometimes under the name "AGI", sometimes using related terms such as "Human Level Intelligence").

In spite of all this progress, however, we feel that no one has yet clearly articulated a detailed, systematic design for an AGI, with potential to yield general intelligence at the human level and ultimately beyond. In this spirit, our main goal in this lengthy two-part book is to outline a novel *design for a thinking machine* – an AGI design which we believe has the capability to produce software systems with intelligence at the human adult level and ultimately beyond. Many of the technical details of this design have been previously presented online in a wikibook [Goe10b]; and the basic ideas of the design have been presented briefly in a series of conference papers [GPSL03, GPPG06, Goe09c]. But the overall design has not been presented in a coherent and systematic way before this book. In order to frame this design properly, we also present a considerable number of broader theoretical and conceptual ideas here, some more and some less technical in nature.

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1.3 CogPrime

The AGI design presented here has not previously been granted a name independently of its particular software implementations, but for the purposes of this book it needs one, so we've christened it **CogPrime** . This fits with the name "OpenCogPrime" that has already been used to describe the software implementation of CogPrime within the open-source OpenCog AGI software framework. The OpenCogPrime software, right now, implements only a small fraction of the CogPrime design as described here. However, OpenCog was designed specifically to enable efficient, scalable implementation of the full CogPrime design (as well as to serve as a more general framework for AGI R&D); and work currently proceeds in this direction, though there is a lot of work still to be done and many challenges remain. [1]

The CogPrime design is more comprehensive and thorough than anything that has been presented in the literature previously, including the work of others reviewed in Chapter 4. It covers all the key aspects of human intelligence, and explains how they interoperate and how they can be implemented in digital computer software. Part 1 of this work outlines CogPrime at a high level, and makes a number of more general points about artificial general intelligence and the path thereto; then Part 2 digs deeply into the technical particulars of CogPrime. Even Part 2, however, doesn't explain all the details of CogPrime that have been worked out so far, and it definitely doesn't explain all the implementation details that have gone into designing and building OpenCogPrime. Creating a thinking machine is a large task, and even the intermediate level of detail takes up a lot of pages.

1.4 The Secret Sauce

There is no consensus on why all the related technological and scientific progress mentioned above has not yet yielded AI software systems with human-like general intelligence (or even greater levels of brilliance!). However, we hypothesize that the core reason boils down to the following three points:

- Intelligence depends on the emergence of certain high-level structures and dynamics across a system's whole knowledge base;
- We have not discovered any one algorithm or approach capable of yielding the emergence of these structures;
- Achieving the emergence of these structures within a system formed by integrating a number of different AI algorithms and structures requires careful attention to the manner in which

[1] This brings up a terminological note: At several places in this Volume and the next we will refer to the current CogPrime or OpenCog implementation; in all cases this refers to OpenCog as of late 2013. We realize the risk of mentioning the state of our software system at time of writing: for future readers this may give the wrong impression, because if our project goes well, more and more of CogPrime will get implemented and tested as time goes on (e.g. within the OpenCog framework, under active development at time of writing). However, not mentioning the current implementation at all seems an even worse course to us, since we feel readers will be interested to know which of our ideas – at time of writing – have been honed via practice and which have not. Online resources such as `http://opencog.org` may be consulted by readers curious about the current state of the main OpenCog implementation; though in future forks of the code may be created, or other systems may be built using some or all of the ideas in this book, etc.

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these algorithms and structures are integrated; and so far the integration has not been done in the correct way.

The human brain appears to be an integration of an assemblage of diverse structures and dynamics, built using common components and arranged according to a sensible cognitive architecture. However, its algorithms and structures have been honed by evolution to work closely together – they are very tightly inter-adapted, in the same way that the different organs of the body are adapted to work together. Due to their close interoperation they give rise to the overall systemic behaviors that characterize human-like general intelligence. We believe that the main missing ingredient in AI so far is **cognitive synergy**: the fitting-together of different intelligent components into an appropriate cognitive architecture, in such a way that the components richly and dynamically support and assist each other, interrelating very closely in a similar manner to the components of the brain or body and thus giving rise to appropriate emergent structures and dynamics. This leads us to one of the central hypotheses underlying the CogPrime approach to AGI: that **the cognitive synergy ensuing from integrating multiple symbolic and subsymbolic learning and memory components in an appropriate cognitive architecture and environment, can yield robust intelligence at the human level and ultimately beyond.**

The reason this sort of intimate integration has not yet been explored much is that it's difficult on multiple levels, requiring the design of an architecture and its component algorithms with a view toward the structures and dynamics that will arise in the system once it is coupled with an appropriate environment. Typically, the AI algorithms and structures corresponding to different cognitive functions have been developed based on divergent theoretical principles, by disparate communities of researchers, and have been tuned for effective performance on different tasks in different environments. Making such diverse components work together in a truly synergetic and cooperative way is a tall order, yet we believe that this – rather than some particular algorithm, structure or architectural principle – is the "secret sauce" needed to create human-level AGI based on technologies available today.

1.5 Extraordinary Proof?

There is a saying that "extraordinary claims require extraordinary proof" and by that standard, if one believes that having a design for an advanced AGI is an extraordinary claim, this book must be rated a failure. We don't offer extraordinary proof that CogPrime, once fully implemented and educated, will be capable of human-level general intelligence and more.

It would be nice if we could offer mathematical proof that CogPrime has the potential we think it does, but at the current time mathematics is simply not up to the job. We'll pursue this direction briefly in Chapter 7 and other chapters, where we'll clarify exactly what kind of mathematical claim "CogPrime has the potential for human-level intelligence" turns out to be. Once this has been clarified, it will be clear that current mathematical knowledge does not yet let us evaluate, or even fully formalize, this kind of claim. Perhaps one day rigorous and detailed analyses of practical AGI designs will be feasible – and we look forward to that day – but it's not here yet.

Also, it would of course be profoundly exciting if we could offer dramatic practical demonstrations of CogPrime's capabilities. We do have a partial software implementation, in the OpenCogPrime system, but currently the things OpenCogPrime does are too simple to really

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serve as proofs of CogPrime's power for advanced AGI. We have used some CogPrime ideas in the OpenCog framework to do things like natural language understanding and data mining, and to control virtual dogs in online virtual worlds; and this has been very useful work in multiple senses. It has taught us more about the CogPrime design; it has produced some useful software systems; and it constitutes fractional work building toward a full OpenCog based implementation of CogPrime. However, to date, the things OpenCogPrime has done are all things that could have been done in different ways without the CogPrime architecture (though perhaps not as elegantly nor with as much room for interesting expansion).

The bottom line is that building an AGI is a big job. Software companies like Microsoft spend dozens to hundreds of man-years building software products like word processors and operating systems, so it should be no surprise that creating a digital intelligence is also a relatively large-scale software engineering project. As time advances and software tools improve, the number of man-hours required to develop advanced AGI gradually decreases – but right now, as we write these words, it's still a rather big job. In the OpenCogPrime project we are making a serious attempt to create a CogPrime based AGI using an open-source development methodology, with the open-source Linux operating system as one of our inspirations. But the open-source methodology doesn't work magic either, and it remains a large project, currently at an early stage. I emphasize this point so that readers lacking software engineering expertise don't take the currently fairly limited capabilities of OpenCogPrime as somehow a damning indictment of the potential of the CogPrime design. The design is one thing, the implementation another – and the OpenCogPrime implementation currently encompasses perhaps one third to one half of the key ideas in this book.

So we don't have extraordinary proof to offer. What we aim to offer instead are clearly-constructed conceptual and technical arguments as to why we think the CogPrime design has dramatic AGI potential.

It is also possible to push back a bit on the common intuition that having a design for human-level AGI is such an "extraordinary claim." It may be extraordinary relative to contemporary science and culture, but we have a strong feeling that the AGI problem is not difficult in the same ways that most people (including most AI researchers) think it is. We suspect that in hindsight, after human-level AGI has been achieved, people will look back in shock that it took humanity so long to come up with a workable AGI design. As you'll understand once you've finished Part 1 of the book, we don't think general intelligence is nearly as "extraordinary" and mysterious as it's commonly made out to be. Yes, building a thinking machine is hard – but humanity has done a lot of other hard things before. It may seem difficult to believe that human-level general intelligence could be achieved by something as simple as a collection of algorithms linked together in an appropriate way and used to control an agent. But we suggest that, once the first powerful AGI systems are produced, it will become apparent that engineering human-level minds is not so profoundly different from engineering other complex systems.

All in all, we'll consider the book successful if a significant percentage of open-minded, appropriately-educated readers come away from it scratching their chins and pondering: *"Hmm. You know, that just might work."* and a small percentage come away thinking *"Now that's an initiative I'd really like to help with!"*.

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1.6 Potential Approaches to AGI

In principle, there is a large number of approaches one might take to building an AGI, starting from the knowledge, software and machinery now available. This is not the place to review them in detail, but a brief list seems apropos, including commentary on why these are not the approaches we have chosen for our own research. Our intent here is not to insult or dismiss these other potential approaches, but merely to indicate why, as researchers with limited time and resources, we have made a different choice regarding where to focus our own energies.

1.6.1 Build AGI from Narrow AI

Most of the AI programs around today are "narrow AI" programs – they carry out one particular kind of task intelligently. One could try to make an advanced AGI by combining a bunch of enhanced narrow AI programs inside some kind of overall framework.

However, we're rather skeptical of this approach because none of these narrow AI programs have the ability to generalize across domains – and we don't see how combining them or extending them is going to cause this to magically emerge.

1.6.2 Enhancing Chatbots

One could seek to make an advanced AGI by taking a chatbot, and trying to improve its code to make it actually understand what it's talking about. We have some direct experience with this route, as in 2010 our AI consulting firm was contracted to improve Ray Kurzweil's online chatbot "Ramona". Our new Ramona understands a lot more than the previous Ramona version or a typical chatbot, due to using Wikipedia and other online resources, but still it's far from an AGI.

A more ambitious attempt in this direction was Jason Hutchens' a-i.com project, which sought to create a human child level AGI via development and teaching of a statistical learning based chatbot (rather than the typical rule-based kind). The difficulty with this approach, however, is that the architecture of a chatbot is fundamentally different from the architecture of a generally intelligent mind. Much of what's important about the human mind is not directly observable in conversations, so if you start from conversation and try to work toward an AGI architecture from there, you're likely to miss many critical aspects.

1.6.3 Emulating the Brain

One can approach AGI by trying to figure out how the brain works, using brain imaging and other tools from neuroscience, and then emulating the brain in hardware or software.

One rather substantial problem with this approach is that we don't really understand how the brain works yet, because our software for measuring the brain is still relatively crude. There is no brain scanning method that combines high spatial and temporal accuracy, and none is

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likely to come about for a decade or two. So to do brain-emulation AGI seriously, one needs to wait a while until brain scanning technology improves.

Current AI methods like neural nets that are loosely based on the brain, are really not brain-like enough to make a serious claim at emulating the brain's approach to general intelligence. We don't yet have any real understanding of how the brain represents abstract knowledge, for example, or how it does reasoning (though the authors, like many others, have made some speculations in this regard [GMIH08]).

Another problem with this approach is that once you're done, what you get is something with a very humanlike mind, and we already have enough of those! However, this is perhaps not such a serious objection, because a digital-computer-based version of a human mind could be studied much more thoroughly than a biology-based human mind. We could observe its dynamics in real-time in perfect precision, and could then learn things that would allow us to build other sorts of digital minds.

1.6.4 Evolve an AGI

Another approach is to try to run an evolutionary process inside the computer, and wait for advanced AGI to evolve.

One problem with this is that we don't know how evolution works all that well. There's a field of artificial life, but so far its results have been fairly disappointing. It's not yet clear how much one can vary on the chemical structures that underly real biology, and still get powerful evolution like we see in real biology. If we need good artificial chemistry to get good artificial biology, then do we need good artificial physics to get good artificial chemistry?

Another problem with this approach, of course, is that it might take a really long time. Evolution took billions of years on Earth, using a massive amount of computational power. To make the evolutionary approach to AGI effective, one would need some radical innovations to the evolutionary process (such as, perhaps, using probabilistic methods like BOA [Pel05] or MOSES [Loo06] in place of traditional evolution).

1.6.5 Derive an AGI design mathematically

One can try to use the mathematical theory of intelligence to figure out how to make advanced AGI.

This interests us greatly, but there's a huge gap between the rigorous math of intelligence as it exists today and anything of practical value. As we'll discuss in Chapter 7, most of the rigorous math of intelligence right now is about how to make AI on computers with dramatically unrealistic amounts of memory or processing power. When one tries to create a theoretical understanding of real-world general intelligence, one arrives at quite different sorts of considerations, as we will roughly outline in Chapter 10. Ideally we would like to be able to study the CogPrime design using a rigorous mathematical theory of real-world general intelligence, but at the moment that's not realistic. The best we can do is to conceptually analyze CogPrime and its various components in terms of relevant mathematical and theoretical ideas; and perform analysis of CogPrime's individual structures and components at varying levels of rigor.

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1.6.6 Use heuristic computer science methods

The computer science field contains a number of abstract formalisms, algorithms and structures that have relevance beyond specific narrow AI applications, yet aren't necessarily understood as thoroughly as would be required to integrate them into the rigorous mathematical theory of intelligence. Based on these formalisms, algorithms and structures, a number of "single formalism/algorithm focused" AGI approaches have been outlined, some of which will be reviewed in Chapter 4. For example Pei Wang's NARS ("Non-Axiomatic Reasoning System") approach is based on a specific logic which he argues to be the "logic of general intelligence" – so, while his system contains many other aspects than this logic, he considers this logic to be the crux of the system and the source of its potential power as an AGI system.

The basic intuition on the part of these "single formalism/algorithm focused" researchers seems to be that there is one key formalism or algorithm underlying intelligence, and if you achieve this key aspect in your AGI program, you're going to get something that fundamentally thinks like a person, even if it has some differences due to its different implementation and embodiment. On the other hand, it's also possible that this idea is philosophically incorrect: that there is no one key formalism, algorithm, structure or idea underlying general intelligence. The CogPrime approach is based on the intuition that to achieve human-level, roughly human-like general intelligence based on feasible computational resources, one needs an appropriate heterogeneous combination of algorithms and structures, each coping with different types of knowledge and different aspects of the problem of achieving goals in complex environments.

1.6.7 Integrative Cognitive Architecture

Finally, to create advanced AGI one can try to build some sort of integrative cognitive architecture: a software system with multiple components that each carry out some cognitive function, and that connect together in a specific way to try to yield overall intelligence.

Cognitive science gives us some guidance about the overall architecture, and computer science and neuroscience give us a lot of ideas about what to put in the different components. But still this approach is very complex and there is a lot of need for creative invention.

This is the approach we consider most "serious" at present (at least until neuroscience advances further). And, as will be discussed in depth in these pages, this is the approach we've chosen: CogPrime is an integrative AGI architecture.

1.6.8 Can Digital Computers Really Be Intelligent?

All the AGI approaches we've just mentioned assume that it's possible to make AGI on digital computers. While we suspect this is correct, we must note that it isn't proven.

It might be that – as Penrose [Pen96], Hameroff [Ham87] and others have argued – we need quantum computers or quantum gravity computers to make AGI. However, there is no evidence of this at this stage. Of course the brain like all matter is described by quantum mechanics, but this doesn't imply that the brain is a "macroscopic quantum system" in a strong sense (like, say, a Bose-Einstein condensate). And even if the brain does use quantum phenomena in

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a dramatic way to carry out some of its cognitive processes (a hypothesis for which there is no current evidence), this doesn't imply that these quantum phenomena are *necessary* in order to carry out the given cognitive processes. For example there is evidence that birds use quantum nonlocal phenomena to carry out navigation based on the Earth's magnetic fields [GRM+11]; yet scientists have built instruments that carry out the same functions without using any special quantum effects. The importance of quantum phenomena in biology (except via their obvious role in giving rise to biological phenomena describable via classical physics) remains a subject of debate [AGBD+08].

Quantum "magic" aside, it is also conceivable that building AGI is fundamentally impossible for some *other* reason we don't understand. Without getting religious about it, it is rationally quite possible that some aspects of the universe are beyond the scope of scientific methods. Science is fundamentally about recognizing patterns in finite sets of bits (e.g. finite sets of finite-precision observations), whereas mathematics recognizes many sets much larger than this. Selmer Bringsjord [BZ03], and other advocates of "hypercomputing" approaches to intelligence, argue that the human mind depends on massively large infinite sets and therefore can never be simulated on digital computers nor understood via finite sets of finite-precision measurements such as science deals with.

But again, while this sort of possibility is interesting to speculate about, there's no real reason to believe it at this time. Brain science and AI are both very young sciences and the "working hypothesis" that digital computers can manifest advanced AGI has hardly been explored at all yet, relative to what will be possible in the next decades as computers get more and more powerful and our understanding of neuroscience and cognitive science gets more and more complete. The CogPrime AGI design presented here is based on this working hypothesis.

Many of the ideas in the book are actually independent of the "mind can be implemented digitally" working hypothesis, and could apply to AGI systems built on analog, quantum or other non-digital frameworks – but we will not pursue these possibilities here. For the moment, outlining an AGI design for digital computers is hard enough! Regardless of speculations about quantum computing in the brain, it seems clear that AGI on quantum computers is part of our future and will be a powerful thing; but the description of a CogPrime analogue for quantum computers will be left for a later work.

1.7 Five Key Words

As noted, the CogPrime approach lies squarely in the integrative cognitive architecture camp. But it is not a haphazard or opportunistic combination of algorithms and data structures. At bottom it is motivated by the *patternist* philosophy of mind laid out in Ben Goertzel's book *The Hidden Pattern* [Goe06a], which was in large part a summary and reformulation of ideas presented in a series of books published earlier by the same author [Goe94], [Goe93a], [Goe93b], [Goe97], [Goe01]. A few of the core ideas of this philosophy are laid out in Chapter 3, though that chapter is by no means a thorough summary.

One way to summarize some of the most important yet commonsensical parts of the patternist philosophy of mind, in an AGI context, is to list five words: **perception, memory, prediction, action, goals**.

In a phrase: **"A mind uses perception and memory to make predictions about which actions will help it achieve its goals."**

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This ties in with the ideas of many other thinkers, including Jeff Hawkins' "memory/prediction" theory [HB06], and it also speaks directly to the formal characterization of intelligence presented in Chapter 7: general intelligence as "the ability to achieve complex goals in complex environments."

Naturally the goals involved in the above phrase may be explicit or implicit to the intelligent agent, and they may shift over time as the agent develops.

Perception is taken to mean pattern recognition: the recognition of (novel or familiar) patterns in the environment or in the system itself. Memory is the storage of already-recognized patterns, enabling recollection or regeneration of these patterns as needed. Action is the formation of patterns in the body and world. Prediction is the utilization of temporal patterns to guess what perceptions will be seen in the future, and what actions will achieve what effects in the future – in essence, prediction consists of temporal pattern recognition, plus the (implicit or explicit) assumption that the universe possesses a "habitual tendency" according to which previously observed patterns continue to apply.

1.7.1 Memory and Cognition in CogPrime

Each of these five concepts has a lot of depth to it, and we won't say too much about them in this brief introductory overview; but we will take a little time to say something about memory in particular.

As we'll see in Chapter 7, one of the things that the mathematical theory of general intelligence makes clear is that, if you assume your AI system has a huge amount of computational resources, then creating general intelligence is not a big trick. Given enough computing power, a very brief and simple program can achieve any computable goal in any computable environment, quite effectively. Marcus Hutter's $AIXI^{tl}$ design [Hut05] gives one way of doing this, backed up by rigorous mathematics. Put informally, what this means is: the problem of AGI is really a problem of coping with inadequate compute resources, just as the problem of natural intelligence is really a problem of coping with inadequate energetic resources.

One of the key ideas underlying CogPrime is a principle called *cognitive synergy*, which explains how real-world minds achieve general intelligence using limited resources, by appropriately organizing and utilizing their memories.

This principle says that there are many different kinds of memory in the mind: sensory, episodic, procedural, declarative, attentional, intentional. Each of them has certain learning processes associated with it; for example, reasoning is associated with declarative memory. Synergy arises here in the way the learning processes associated with each kind of memory have got to help each other out when they get stuck, rather than working at cross-purposes.

Cognitive synergy is a fundamental principle of *general intelligence* – it doesn't tend to play a central role when you're building narrow-AI systems.

In the CogPrime approach all the different kinds of memory are linked together in a single meta-representation, a sort of combined semantic/neural network called the AtomSpace. It represents everything from perceptions and actions to abstract relationships and concepts and even a system's model of itself and others. When specialized representations are used for other types of knowledge (e.g. program trees for procedural knowledge, spatiotemporal hierarchies for perceptual knowledge) then the knowledge stored outside the AtomSpace is represented via

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tokens (Atoms) in the AtomSpace, allowing it to be located by various cognitive processes, and associated with other memory items of any type.

So for instance an OpenCog AI system has an AtomSpace, plus some specialized knowledge stores linked into the AtomSpace; and it also has specific algorithms acting on the AtomSpace and appropriate specialized stores corresponding to each type of memory. Each of these algorithms is complex and has its own story; for instance (an incomplete list, for more detail see the following section of this Introduction):

- Declarative knowledge is handled using Probabilistic Logic Networks, described in Chapter 34 and others;
- Procedural knowledge is handled using MOSES, a probabilistic evolutionary learning algorithm described in Chapter 21 and others;
- Attentional knowledge is handled by ECAN (economic attention allocation), described in Chapter 23 and others;
- OpenCog contains a language comprehension system called RelEx that takes English sentences and turns them into nodes and links in the AtomSpace. It's currently being extended to handle Chinese. RelEx handles mostly declarative knowledge but also involves some procedural knowledge for linguistic phenomena like reference resolution and semantic disambiguation.

But the crux of the CogPrime cognitive architecture is not any particular cognitive process, but rather the way they all work together using cognitive synergy.

1.8 Virtually and Robotically Embodied AI

Another issue that will arise frequently in these pages is embodiment. There's a lot of debate in the AI community over whether embodiment is necessary for advanced AGI or not. Personally, we doubt it's necessary but we think it's extremely convenient, and are thus considerably interested in both virtual world and robotic embodiment. The CogPrime architecture itself is neutral on the issue of embodiment, and it could be used to build a mathematical theorem prover or an intelligent chat bot just as easily as an embodied AGI system. However, most of our attention has gone into figuring out how to use CogPrime to control embodied agents in virtual worlds, or else (to a lesser extent) physical robots. For instance, during 2011-2012 we are involved in a Hong Kong government funded project using OpenCog to control video game agents in a simple game world modeled on the game Minecraft [GPC+11].

Current virtual world technology has significant limitations that make them far less than ideal from an AGI perspective, and in Chapter 16 we will discuss how they can be remedied. However, for the medium-term future virtual worlds are not going to match the natural world in terms of richness and complexity – and so there's also something to be said for physical robots that interact with all the messiness of the real world.

With this in mind, in the Artificial Brain Lab at Xiamen University in 2009-2010, we conducted some experiments using OpenCog to control the Nao humanoid robot [GD09]. The goal of that work was to take the same code that controls the virtual dog and use it to control the physical robot. But it's harder because in this context we need to do real vision processing and real motor control. A similar project is being undertaken in Hong Kong at time of writing, involving a collaboration between OpenCog AI developers and David Hanson's robotics

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group. One of the key ideas involved in this project is explicit integration of subsymbolic and more symbolic subsystems. For instance, one can use a purely subsymbolic, hierarchical pattern recognition network for vision processing, and then link its internal structures into the nodes and links in the AtomSpace that represent concepts. So the subsymbolic and symbolic systems can work harmoniously and productively together, a notion we will review in more detail in Chapter 26.

1.9 Language Learning

One of the subtler aspects of our current approach to teaching CogPrime is language learning. Three relatively crisp and simple approaches to language learning would be:

- Build a language processing system using hand-coded grammatical rules, based on linguistic theory;
- Train a language processing system using supervised, unsupervised or semisupervised learning, based on computational linguistics;
- Have an AI system learn language via experience, based on imitation and reinforcement and experimentation, without any built-in distinction between linguistic behaviors and other behaviors.

While the third approach is conceptually appealing, our current approach in CogPrime (described in a series of chapters in Part 2) is none of the above, but rather a combination of the above. OpenCog contains a natural language processing system built using a combination of the rule-based and statistical approaches, which has reasonably adequate functionality; and our plan is to use it as an initial condition for ongoing adaptive improvement based on embodied communicative experience.

1.10 AGI Ethics

When discussing AGI work with the general public, ethical concerns often arise. Science fiction films like the *Terminator* series have raised public awareness of the possible dangers of advanced AGI systems without correspondingly advanced ethics. Non-profit organizations like the Singularity Institute for AI ((http://singinst.org) have arisen specifically to raise attention about, and foster research on, these potential dangers.

Our main focus here is on how to create AGI, not how to teach an AGI human ethical principles. However, we will address the latter issue explicitly in Chapter 12, and we do think it's important to emphasize that AGI ethics has been at the center of the design process throughout the conception and development of CogPrime and OpenCog.

Broadly speaking there are (at least) two major threats related to advanced AGI. One is that people might use AGIs for bad ends; and the other is that, even if an AGI is made with the best intentions, it might reprogram itself in a way that causes it to do something terrible. If it's smarter than us, we might be watching it carefully while it does this, and have no idea what's going on.

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The best way to deal with this second "bad AGI" problem is to build ethics into your AGI architecture – and we have done this with CogPrime, via creating a goal structure that explicitly supports ethics-directed behavior, and via creating an overall architecture that supports "ethical synergy" along with cognitive synergy. In short, the notion of ethical synergy is that there are different kinds of ethical thinking associated with the different kinds of memory and you want to be sure your AGI has all of them, and that it uses them together effectively.

In order to create AGI that is not only intelligent but beneficial to other sentient beings, ethics has got to be part of the design and the roadmap. As we teach our AGI systems, we need to lead them through a series of instructional and evaluative tasks that move from a primitive level to the mature human level – in intelligence, but also in ethical judgment.

1.11 Structure of the Book

The book is divided into two parts. The technical particulars of CogPrime are discussed in Part 2; what we deal with in Part 1 are important preliminary and related matters such as:

- The nature of real-world general intelligence, both conceptually and from the perspective of formal modeling (Section I).
- The nature of cognitive and ethical development for humans and AGIs (Section III).
- The high-level properties of CogPrime, including the overall architecture and the various sorts of memory involved (Section IV).
- What kind of path may viably lead us from here to AGI, with focus laid on preschool-type environments that easily foster humanlike cognitive development. Various advanced aspects of AGI systems, such as the network and algebraic structures that may emerge from them, the ways in which they may self-modify, and the degree to which their initial design may constrain or guide their future state even after long periods of radical self-improvement (Section V).

One point made repeatedly throughout Part 1, which is worth emphasizing here, is the current lack of a really rigorous and thorough general technical theory of general intelligence. Such a theory, if complete, would be incredibly helpful for understanding complex AGI architectures like CogPrime. Lacking such a theory, we must work on CogPrime and other such systems using a combination of theory, experiment and intuition. This is not a bad thing, but it will be very helpful if the theory and practice of AGI are able to grow collaboratively together.

1.12 Key Claims of the Book

We will wrap up this Introduction with a systematic list of some of the key claims to be argued for in these pages. Not all the terms and ideas in these claims have been mentioned in the preceding portions of this Introduction, but we hope they will be reasonably clear to the reader anyway, at least in a general sense. This list of claims will be revisited in Chapter 49 near the end of Part 2, where we will look back at the ideas and arguments that have been put forth in favor of them, in the intervening chapters.

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In essence this is a list of claims such that, if the reader accepts these claims, they should probably accept that the CogPrime approach to AGI is a viable one. On the other hand if the reader rejects one or more of these claims, they may find one or more aspects of CogPrime unacceptable for some reason.

Without further ado, now, the claims:

1. General intelligence (at the human level and ultimately beyond) can be achieved via creating a computational system that seeks to achieve its goals, via using perception and memory to predict which actions will achieve its goals in the contexts in which it finds itself.
2. To achieve general intelligence in the context of human-intelligence-friendly environments and goals using feasible computational resources, it's important that an AGI system can handle different kinds of memory (declarative, procedural, episodic, sensory, intentional, attentional) in customized but interoperable ways.
3. Cognitive synergy: It's important that the cognitive processes associated with different kinds of memory can appeal to each other for assistance in overcoming bottlenecks in a manner that enables each cognitive process to act in a manner that is sensitive to the particularities of each others' internal representations, and that doesn't impose unreasonable delays on the overall cognitive dynamics.
4. As a general principle, neither purely localized nor purely global memory is sufficient for general intelligence under feasible computational resources; "glocal" memory will be required.
5. To achieve human-like general intelligence, it's important for an intelligent agent to have sensory data and motoric affordances that roughly emulate those available to humans. We don't know exactly how close this emulation needs to be, which means that our AGI systems and platforms need to support fairly flexible experimentation with virtual-world and/or robotic infrastructures.
6. To work toward adult human-level, roughly human-like general intelligence, one fairly easily comprehensible path is to use environments and goals reminiscent of human childhood, and seek to advance one's AGI system along a path roughly comparable to that followed by human children.
7. It is most effective to teach an AGI system aimed at roughly human-like general intelligence via a mix of spontaneous learning and explicit instruction, and to instruct it via a combination of imitation, reinforcement and correction, and a combination of linguistic and nonlinguistic instruction.
8. One effective approach to teaching an AGI system human language is to supply it with some in-built linguistic facility, in the form of rule-based and statistical-linguistics-based NLP systems, and then allow it to improve and revise this facility based on experience.
9. An AGI system with adequate mechanisms for handling the key types of knowledge mentioned above, and the capability to explicitly recognize large-scale patterns in itself, should, **upon sustained interaction with an appropriate environment in pursuit of appropriate goals**, emerge a variety of complex structures in its internal knowledge network, including, but not limited to:
   - a hierarchical network, representing both a spatiotemporal hierarchy and an approximate "default inheritance" hierarchy, cross-linked
   - a heterarchical network of associativity, roughly aligned with the hierarchical network
   - a self network which is an approximate micro image of the whole network

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- inter-reflecting networks modeling self and others, reflecting a "mirrorhouse" design pattern

10. Given the strengths and weaknesses of current and near-future digital computers,
    a. A (loosely) neural-symbolic network is a good representation for directly storing many kinds of memory, and interfacing between those that it doesn't store directly;
    b. Uncertain logic is a good way to handle declarative knowledge. To deal with the problems facing a human-level AGI, an uncertain logic must integrate imprecise probability and fuzziness with a broad scope of logical constructs. PLN is one good realization.
    c. Programs are a good way to represent procedures (both cognitive and physical-action, but perhaps not including low-level motor-control procedures).
    d. Evolutionary program learning is a good way to handle difficult program learning problems. Probabilistic learning on normalized programs is one effective approach to evolutionary program learning. MOSES is one good realization of this approach.
    e. Multistart hill-climbing, with a strong Occam prior, is a good way to handle relatively straightforward program learning problems.
    f. Activation spreading and Hebbian learning comprise a reasonable way to handle attentional knowledge (though other approaches, with greater overhead cost, may provide better accuracy and may be appropriate in some situations).
        - Artificial economics is an effective approach to activation spreading and Hebbian learning in the context of neural-symbolic networks;
        - ECAN is one good realization of artificial economics;
        - A good trade-off between comprehensiveness and efficiency is to focus on two kinds of attention: processor attention (represented in CogPrime by ShortTermImportance) and memory attention (represented in CogPrime by LongTermImportance).
    g. Simulation is a good way to handle episodic knowledge (remembered and imagined). Running an internal world simulation engine is an effective way to handle simulation.
    h. Hybridization of one's integrative neural-symbolic system with a spatiotemporally hierarchical deep learning system is an effective way to handle representation and learning of low-level sensorimotor knowledge. DeSTIN is one example of a deep learning system of this nature that can be effective in this context.
    i. One effective way to handle goals is to represent them declaratively, and allocate attention among them economically. CogPrime's PLN/ECAN based framework for handling intentional knowledge is one good realization.

11. It is important for an intelligent system to have some way of recognizing large-scale patterns in itself, and then embodying these patterns as new, localized knowledge items in its memory. Given the use of a neural-symbolic network for knowledge representation, a graph-mining based "map formation" heuristic is one good way to do this.
12. Occam's Razor: Intelligence is closely tied to the creation of procedures that achieve goals in environments *in the simplest possible way*. Each of an AGI system's cognitive algorithms should embody a simplicity bias in some explicit or implicit form.
13. An AGI system, if supplied with a commonsensically ethical goal system and an intentional component based on rigorous uncertain inference, should be able to reliably achieve a much higher level of commonsensically ethical behavior than any human being.
14. Once sufficiently advanced, an AGI system with a logic-based declarative knowledge approach and a program-learning-based procedural knowledge approach should be able to

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radically self-improve via a variety of methods, including supercompilation and automated theorem-proving.

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Section I
Artificial and Natural General Intelligence

Chapter 2
What Is Human-Like General Intelligence?

2.1 Introduction

CogPrime, the AGI architecture on which the bulk of this book focuses, is aimed at the creation of artificial general intelligence that is vaguely human-like in nature, and possesses capabilities at the human level and ultimately beyond.

Obviously this description begs some foundational questions, such as, for starters: What is "general intelligence"? What is "human-like general intelligence"? What is "intelligence" at all?

Perhaps in the future there will exist a rigorous theory of general intelligence which applies usefully to real-world biological and digital intelligences. In later chapters we will give some ideas in this direction. But such a theory is currently nascent at best. So, given the present state of science, these two questions about intelligence must be handled via a combination of formal and informal methods. This brief, informal chapter attempts to explain our view on the nature of intelligence in sufficient detail to place the discussion of CogPrime in appropriate context, without trying to resolve all the subtleties.

Psychologists sometimes define human general intelligence using IQ tests and related instruments – so one might wonder: why not just go with that? But these sorts of intelligence testing approaches have difficulty even extending to humans from diverse cultures [HHPO12] [Fis01]. So it's clear that to ground AGI approaches that are not based on precise modeling of human cognition, one requires a more fundamental understanding of the nature of general intelligence. On the other hand, if one conceives intelligence too broadly and mathematically, there's a risk of leaving the real human world too far behind. In this chapter (followed up in Chapters 9 and 7 with more rigor), we present a highly abstract understanding of intelligence-in-general, and then portray human-like general intelligence as a (particularly relevant) special case.

2.1.1 What Is General Intelligence?

Many attempts to characterize general intelligence have been made; Legg and Hutter [LH07a] review over 70! Our preferred abstract characterization of intelligence is: **the capability of a system to choose actions maximizing its goal-achievement, based on its perceptions and memories, and making reasonably efficient use of its computational resources**

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[Goe10c]. A general intelligence is then understood as one that can do this for a variety of complex goals in a variety of complex environments.

However, apart from positing definitions, it is difficult to say anything nontrivial about general intelligence *in general*. Marcus Hutter [Hut05] has demonstrated, using a characterization of general intelligence similar to the one above, that a very simple algorithm called AIXI^{tl} can demonstrate arbitrarily high levels of general intelligence, if given sufficiently immense computational resources. This is interesting because it shows that (if we assume the universe can effectively be modeled as a computational system) general intelligence is basically a problem of computational efficiency. The particular structures and dynamics that characterize real-world general intelligences like humans arise because of the need to achieve reasonable levels of intelligence using modest space and time resources.

The "patternist" theory of mind presented in [Goe06a] and briefly summarized in Chapter 3 below presents a number of *emergent structures and dynamics* that are hypothesized to characterize pragmatic general intelligence, including such things as system-wide hierarchical and heterarchical knowledge networks, and a dynamic and self-maintaining self-model. Much of the thinking underlying CogPrime has centered on how to make multiple learning components combine to give rise to these emergent structures and dynamics.

2.1.2 What Is Human-like General Intelligence?

General principles like "complex goals in complex environments" and patternism are not sufficient to specify the nature of *human-like* general intelligence. Due to the harsh reality of computational resource restrictions, real-world general intelligences are necessarily biased to particular classes of environments. Human intelligence is biased toward the physical, social and linguistic environments in which humanity evolved, and if AI systems are to possess humanlike general intelligence they must to some extent share these biases.

But what are these biases, specifically? This is a large and complex question, which we seek to answer in a theoretically grounded way in Chapter 9. However, before turning to abstract theory, one may also approach the question in a pragmatic way, by looking at the categories of things that humans do to manifest their particular variety of general intelligence. This is the task of the following section.

2.2 Commonly Recognized Aspects of Human-like Intelligence

It would be nice if we could give some sort of "standard model of human intelligence" in this chapter, to set the context for our approach to artificial general intelligence – but the truth is that there isn't any. What the cognitive science field has produced so far is better described as: a broad set of principles and platitudes, plus a long, loosely-organized list of ideas and results. Chapter 5 below constitutes an attempt to present an integrative architecture diagram for human-like general intelligence, synthesizing the ideas of a number of different AGI and cognitive theorists. However, though the diagram given there attempts to be inclusive, it nonetheless contains many features that are accepted by only a plurality of the research community.

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The following list of key aspects of human-like intelligence has a better claim at truly being generic and representing the consensus understanding of contemporary science. It was produced by a very simple method: starting with the Wikipedia page for cognitive psychology, and then adding a few items onto it based on scrutinizing the tables of contents of some top-ranked cognitive psychology textbooks. There is some redundancy among list items, and perhaps also some minor omissions (depending on how broadly one construes some of the items), but the point is to give a broad indication of human mental functions as standardly identified in the psychology field:

- Perception
  - General perception
  - Psychophysics
  - Pattern recognition (the ability to correctly interpret ambiguous sensory information)
  - Object and event recognition
  - Time sensation (awareness and estimation of the passage of time)
- Motor Control
  - Motor planning
  - Motor execution
  - Sensorimotor integration
- Categorization
  - Category induction and acquisition
  - Categorical judgement and classification
  - Category representation and structure
  - Similarity
- Memory
  - Aging and memory
  - Autobiographical memory
  - Constructive memory
  - Emotion and memory
  - False memories
  - Memory biases
  - Long-term memory
  - Episodic memory
  - Semantic memory
  - Procedural memory
  - Short-term memory
  - Sensory memory
  - Working memory
- Knowledge representation
  - Mental imagery
  - Propositional encoding
  - Imagery versus propositions as representational mechanisms

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  - Dual-coding theories
  - Mental models

- Language
  - Grammar and linguistics
  - Phonetics and phonology
  - Language acquisition

- Thinking
  - Choice
  - Concept formation
  - Judgment and decision making
  - Logic, formal and natural reasoning
  - Problem solving
  - Planning
  - Numerical cognition
  - Creativity

- Consciousness
  - Attention and Filtering (the ability to focus mental effort on specific stimuli whilst excluding other stimuli from consideration)
  - Access consciousness
  - Phenomenal consciousness

- Social Intelligence
  - Distributed Cognition
  - Empathy

If there's nothing surprising to you in the above list, I'm not surprised! If you've read a bit in the modern cognitive science literature, the list may even seem trivial. But it's worth reflecting that 50 years ago, no such list could have been produced with the same level of broad acceptance. And less than 100 years ago, the Western world's scientific understanding of the mind was dominated by Freudian thinking; and not too long after that, by behaviorist thinking, which argued that theorizing about what went on inside the mind made no sense, and science should focus entirely on analyzing external behavior. The progress of cognitive science hasn't made as many headlines as contemporaneous progress in neuroscience or computing hardware and software, but it's certainly been dramatic. One of the reasons that AGI is more achievable now than in the 1950s and 60s when the AI field began, is that now we understand the structures and processes characterizing human thinking a lot better.

In spite of all the theoretical and empirical progress in the cognitive science field, however, there is still no consensus among experts on how the various aspects of intelligence in the above "human intelligence feature list" are achieved and interrelated. In these pages, however, for the purpose of motivating CogPrime, we assume a broad integrative understanding roughly as follows:

- **Perception**: There is significant evidence that human visual perception occurs using a spatiotemporal hierarchy of pattern recognition modules, in which higher-level modules

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deal with broader spacetime regions, roughly as in the DeSTIN AGI architecture discussed in Chapter 4. Further, there is evidence that each module carries out temporal predictive pattern recognition as well as static pattern recognition. Audition likely utilizes a similar hierarchy. Olfaction may use something more like a Hopfield attractor neural network, as described in Chapter 13. The networks corresponding to different sense modalities have multiple cross-linkages, more at the upper levels than the lower, and also link richly into the parts of the mind dealing with other functions.

- **Motor Control**: This appears to be handled by a spatiotemporal hierarchy as well, in which each level of the hierarchy corresponds to higher-level (in space and time) movements. The hierarchy is very tightly linked in with the perceptual hierarchies, allowing sensorimotor learning and coordination.
- **Memory**: There appear to be multiple distinct but tightly cross-linked memory systems, corresponding to different sorts of knowledge such as declarative (facts and beliefs), procedural, episodic, sensorimotor, attentional and intentional (goals).
- **Knowledge Representation**: There appear to be multiple base-level representational systems; at least one corresponding to each memory system, but perhaps more than that. Additionally there must be the capability to dynamically create new context-specific representational systems founded on the base representational system.
- **Language**: While there is surely some innate biasing in the human mind toward learning certain types of linguistic structure, it's also notable that language shares a great deal of structure with other aspects of intelligence like social roles [CB00] and the physical world [Cas07]. Language appears to be learned based on biases toward learning certain types of relational role systems; and language processing seems a complex mix of generic reasoning and pattern recognition processes with specialized acoustic and syntactic processing routines.
- **Consciousness** is pragmatically well-understood using Baars' "global workspace" theory, in which a small subset of the mind's content is summoned at each time into a "working memory" aka "workspace" aka "attentional focus" where it is heavily processed and used to guide action selection.
- **Thinking** is a diverse combination of processes encompassing things like categorization, (crisp and uncertain) reasoning, concept creation, pattern recognition, and others; these processes must work well with all the different types of memory and must effectively integrate knowledge in the global workspace with knowledge in long-term memory.
- **Social Intelligence** seems closely tied with language and also with self-modeling; we model ourselves in large part using the same specialized biases we use to help us model others.

None of the points in the above bullet list is particularly controversial, but neither are any of them universally agreed-upon by experts. However, in order to make any progress on AGI design one must make some commitments to particular cognition-theoretic understandings, at this level and ultimately at more precise levels as well. Further, general philosophical analyses like the patternist philosophy to be reviewed in the following chapter only provide limited guidance here. Patternism provides a filter for theories about specific cognitive functions – it rules out assemblages of cognitive-function-specific theories that don't fit together to yield a mind that could act effectively as a pattern-recognizing, goal-achieving system with the right internal emergent structures. But it's not a precise enough filter to serve as a sole guide for cognitive theory even at the high level.

The above list of points leads naturally into the integrative architecture diagram presented in Chapter 5. But that generic architecture diagram is fairly involved, and before presenting

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it, we will go through some more background regarding human-like intelligence (in the rest of this chapter), philosophy of mind (in Chapter 3) and contemporary AGI architectures (in Chapter4).

2.3 Further Characterizations of Humanlike Intelligence

We now present a few complementary approaches to characterizing the key aspects of human-like intelligence, drawn from different perspectives in the psychology and AI literature. These different approaches all overlap substantially, which is good, yet each gives a slightly different slant.

2.3.1 Competencies Characterizing Human-like Intelligence

First we give a list of key competencies characterizing human level intelligence resulting from the the AGI Roadmap Workshop held at the University of Knoxville in October 2008 [1], which was organized by Ben Goertzel and Itamar Arel. In this list, each broad competency area is listed together with a number of specific competencies sub-areas within its scope:

1. **Perception**: vision, hearing, touch, proprioception, crossmodal
2. **Actuation**: physical skills, navigation, tool use
3. **Memory**: episodic, declarative, behavioral
4. **Learning**: imitation, reinforcement, interactive verbal instruction, written media, experimentation
5. **Reasoning**: deductive, abductive, inductive, causal, physical, associational, categorization
6. **Planning**: strategic, tactical, physical, social
7. **Attention**: visual, social, behavioral
8. **Motivation**: subgoal creation, affect-based motivation, control of emotions
9. **Emotion**: expressing emotion, understanding emotion
10. **Self**: self-awareness, self-control, other-awareness
11. **Social**: empathy, appropriate social behavior, social communication, social inference, group play, theory of mind
12. **Communication**: gestural, pictorial, verbal, language acquisition, cross-modal
13. **Quantitative**: counting, grounded arithmetic, comparison, measurement
14. **Building/Creation**: concept formation, verbal invention, physical construction, social group formation

Clearly this list is getting at the same things as the textbook headings given in Section 2.2, but with a different emphasis due to its origin among AGI researchers rather than cognitive

[1] See `http://www.ece.utk.edu/~itamar/AGI_Roadmap.html`; participants included: Sam Adams, IBM Research; Ben Goertzel, Novamente LLC; Itamar Arel, University of Tennessee; Joscha Bach, Institute of Cognitive Science, University of Osnabruck, Germany; Robert Coop, University of Tennessee; Rod Furlan, Singularity Institute; Matthias Scheutz, Indiana University; J. Storrs Hall, Foresight Institute; Alexei Samsonovich, George Mason University; Matt Schlesinger, Southern Illinois University; John Sowa, Vivomind Intelligence, Inc.; Stuart C. Shapiro, University at Buffalo

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psychologists. As part of the AGI Roadmap project, specific tasks were created corresponding to each of the sub-areas in the above list; we will describe some of these tasks in Chapter 17.

2.3.2 Gardner's Theory of Multiple Intelligences

The diverse list of human-level "competencies" given above is reminiscent of Gardner's [Gar99] multiple intelligences (MI) framework – a psychological approach to intelligence assessment based on the idea that different people have mental strengths in different high-level domains, so that intelligence tests should contain aspects that focus on each of these domains separately. MI does not contradict the "complex goals in complex environments" view of intelligence, but rather may be interpreted as making specific commitments regarding which complex tasks and which complex environments are most important for roughly human-like intelligence.

MI does not seek an extreme generality, in the sense that it explicitly focuses on domains in which humans have strong innate capability as well as general-intelligence capability; there could easily be non-human intelligences that would exceed humans according to both the commonsense human notion of "general intelligence" and the generic "complex goals in complex environments" or Hutter/Legg-style definitions, yet would not equal humans on the MI criteria. This strong anthropocentrism of MI is not a problem from an AGI perspective so long as one uses MI in an appropriate way, i.e. only for assessing the extent to which an AGI system displays specifically *human-like* general intelligence. This restrictiveness is the price one pays for having an easily articulable and relatively easily implementable evaluation framework.

Table **??** summarizes the types of intelligence included in Gardner's MI theory.

Intelligence Type	Aspects
Linguistic	Words and language, written and spoken; retention, interpretation and explanation of ideas and information via language; understands relationship between communication and meaning
Logical-Mathematical	Logical thinking, detecting patterns, scientific reasoning and deduction; analyse problems, perform mathematical calculations, understands relationship between cause and effect towards a tangible outcome
Musical	Musical ability, awareness, appreciation and use of sound; recognition of tonal and rhythmic patterns, understands relationship between sound and feeling
Bodily-Kinesthetic	Body movement control, manual dexterity, physical agility and balance; eye and body coordination
Spatial-Visual	Visual and spatial perception; interpretation and creation of images; pictorial imagination and expression; understands relationship between images and meanings, and between space and effect
Interpersonal	Perception of other people's feelings; relates to others; interpretation of behaviour and communications; understands relationships between people and their situations

Table 2.1: Types of Intelligence in Gardner's Multiple Intelligence Theory

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2.3.3 Newell's Criteria for a Human Cognitive Architecture

Finally, another related perspective is given by Alan Newell's "functional criteria for a human cognitive architecture" [New90], which require that a humanlike AGI system should:

1. Behave as an (almost) arbitrary function of the environment
2. Operate in real time
3. Exhibit rational, i.e., effective adaptive behavior
4. Use vast amounts of knowledge about the environment
5. Behave robustly in the face of error, the unexpected, and the unknown
6. Integrate diverse knowledge
7. Use (natural) language
8. Exhibit self-awareness and a sense of self
9. Learn from its environment
10. Acquire capabilities through development
11. Arise through evolution
12. Be realizable within the brain

In our view, Newell's criterion 1 is poorly-formulated, for while universal Turing computing power is easy to come by, any finite AI system must inevitably be heavily adapted to some particular class of environments for straightforward mathematical reasons [Hut05, GPI+10]. On the other hand, his criteria 11 and 12 are not relevant to the CogPrime approach as we are not doing biological modeling but rather AGI engineering. However, Newell's criteria 2-10 are essential in our view, and all will be covered in the following chapters.

2.3.4 intelligence and Creativity

Creativity is a key aspect of intelligence. While sometimes associated especially with genius-level intelligence in science or the arts, actually creativity is pervasive throughout intelligence, at all levels. When a child makes a flying toy car by pasting paper bird wings on his toy car, and when a bird figures out how to use a curved stick to get a piece of food out of a difficult corner – this is creativity, just as much as the invention of a new physics theory or the design of a new fashion line. The very nature of intelligence – achieving complex goals in complex environments – requires creativity for its achievement, because the nature of complex environments and goals is that they are always unveiling new aspects, so that dealing with them involves inventing things beyond what worked for previously known aspects.

CogPrime contains a number of cognitive dynamics that are especially effective at creating new ideas, such as: concept creation (which synthesizes new concepts via combining aspects of previous ones), probabilistic evolutionary learning (which simulates evolution by natural selection, creating new procedures via mutation, combination and probabilistic modeling based on previous ones), and analogical inference (an aspect of the Probabilistic Logic Networks subsystems). But ultimately creativity is about how a system combines all the processes at its disposal to synthesize novel solutions to the problems posed by its goals in its environment.

There are times, of course, when the same goal can be achieved in multiple ways – some more creative than others. In CogPrime this relates to the existence of multiple top-level goals, one of which may be **novelty**. A system with novelty as one of its goals, alongside other more

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specific goals, will have a tendency to solve other problems in creative ways, thus fulfilling its novelty goal along with its other goals. This can be seen at the level of childlike behaviors, and also at a much more advanced level. Salvador Dali wanted to depict his thoughts and feelings, but he also wanted to do so in a striking and unusual way; this combination of aspirations spurred him to produce his amazing art. A child who is asked to draw a house, but has a goal of novelty, may draw a tower with a swimming pool on the roof rather than a typical Colonial structure. A physical motivated by novelty will seek a non-obvious solution to the equation at hand, rather than just applying tried and true methods, and perhaps discover some new phenomenon. Novelty can be measured formally in terms of information-theoretic surprisingness based upon a given basis of knowledge and experience [Sch06]; something that is novel and creative to a child may be familiar to the adult world, and a solution that seems novel and creative to a brilliant scientist today, may seem like cliche' elementary school level work 100 years from now.

Measuring creativity is even more difficult and subjective than measuring intelligence. Qualitatively, however, we humans can recognize it; and we suspect that the qualitative emergence of dramatic, multidisciplinary computational creativity will be one of the things that makes the human population feel emotionally that advanced AGI has finally arrived.

2.4 Preschool as a View into Human-like General Intelligence

One issue that arises when pursuing the grand goal of human-level general intelligence is how to measure partial progress. The classic Turing Test of imitating human conversation remains too difficult to usefully motivate immediate-term AI research (see [HF95] [Fre90] for arguments that it has been counterproductive for the AI field). The same holds true for comparable alternatives like the Robot College Test of creating a robot that can attend a semester of university and obtain passing grades. However, some researchers have suggested intermediary goals, that constitute partial progress toward the grand goal and yet are qualitatively different from the highly specialized problems to which most current AI systems are applied.

In this vein, Sam Adams and his team at IBM have outlined a so-called "Toddler Turing Test," in which one seeks to use AI to control a robot qualitatively displaying similar cognitive behaviors to a young human child (say, a 3 year old) [AABL02]. In fact this sort of idea has a long and venerable history in the AI field – Alan Turing's original 1950 paper on AI [Tur50], where he proposed the Turing Test, contains the suggestion that

> *"Instead of trying to produce a programme to simulate the adult mind, why not rather try to produce one which simulates the child's?"*

We find this childlike cognition based approach promising for many reasons, including its integrative nature: what a young child does involves a combination of perception, actuation, linguistic and pictorial communication, social interaction, conceptual problem solving and creative imagination. Specifically, inspired by these ideas, in Chapter 16 we will suggest the approach of teaching and testing early-stage AGI systems in environments that emulate the preschools used for teaching human children.

Human intelligence evolved in response to the demands of richly interactive environments, and a preschool is specifically designed to be a richly interactive environment with the capability to stimulate diverse mental growth. So, we are currently exploring the use of CogPrime to control

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virtual agents in preschool-like virtual world environments, as well as commercial humanoid robot platforms such as the Nao (see Figure 2.1) or Robokind (2.2) in physical preschool-like robot labs.

Another advantage of focusing on childlike cognition is that child psychologists have created a variety of instruments for measuring child intelligence. In Chapter 17, we will discuss an approach to evaluating the general intelligence of human childlike AGI systems via combining tests typically used to measure the intelligence of young human children, with additional tests crafted based on cognitive science and the standard preschool curriculum.

To put it differently: While our long-term goal is the creation of genius machines with general intelligence at the human level and beyond, we believe that every young child has a certain genius; and by beginning with this childlike genius, we can built a platform capable of developing into a genius machine with far more dramatic capabilities.

2.4.1 Design for an AGI Preschool

More precisely, we don't suggest to place a CogPrime system in an environment that is an exact imitation of a human preschool – this would be inappropriate since current robotic or virtual bodies are very differently abled than the body of a young human child. But we aim to place CogPrime in an environment emulating the basic diversity and educational character of a typical human preschool. We stress this now, at this early point in the book, because we will use running examples throughout the book drawn from the preschool context.

The key notion in modern preschool design is the "learning center," an area designed and outfitted with appropriate materials for teaching a specific skill. Learning centers are designed to encourage learning by doing, which greatly facilitates learning processes based on reinforcement, imitation and correction; and also to provide multiple techniques for teaching the same skills, to accommodate different learning styles and prevent overfitting and overspecialization in the learning of new skills.

Centers are also designed to cross-develop related skills. A "manipulatives center," for example, provides physical objects such as drawing implements, toys and puzzles, to facilitate development of motor manipulation, visual discrimination, and (through sequencing and classification games) basic logical reasoning. A "dramatics center" cross-trains interpersonal and empathetic skills along with bodily-kinesthetic, linguistic, and musical skills. Other centers, such as art, reading, writing, science and math centers are also designed to train not just one area, but to center around a primary intelligence type while also cross-developing related areas. For specific examples of the learning centers associated with particular contemporary preschools, see [Nei98]. In many progressive, student-centered preschools, students are left largely to their own devices to move from one center to another throughout the preschool room. Generally, each center will be staffed by an instructor at some points in the day but not others, providing a variety of learning experiences.

To imitate the general character of a human preschool, we will create several centers in our robot lab. The precise architecture will be adapted via experience but initial centers will likely be:

- **a blocks center**: a table with blocks on it
- **a language center**: a circle of chairs, intended for people to sit around and talk with the robot

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- **a manipulatives center**, with a variety of different objects of different shapes and sizes, intended to teach visual and motor skills
- **a ball play center**: where balls are kept in chests and there is space for the robot to kick the balls around
- **a dramatics center** where the robot can observe and enact various movements

One Running Example

As we proceed through the various component structures and dynamics of CogPrime in the following chapters, it will be useful to have a few running examples to use to explain how the various parts of the system are supposed to work. One example we will use fairly frequently is drawn from the preschool context: the somewhat open-ended task of **Build me something out of blocks, that you haven't built for me before, and then tell me what it is**. This is a relatively simple task that combines multiple aspects of cognition in a richly interconnected way, and is the sort of thing that young children will naturally do in a preschool setting.

2.5 Integrative and Synergetic Approaches to Artificial General Intelligence

In Chapter 1 we characterized CogPrime as an integrative approach. And we suggest that the naturalness of integrative approaches to AGI follows directly from comparing above lists of capabilities and criteria to the array of available AI technologies. No single known algorithm or data structure appears easily capable of carrying out all these functions, so if one wants to proceed *now* with creating a general intelligence that is even vaguely humanlike, one must integrate various AI technologies within some sort of unifying architecture.

For this reason and others, an increasing amount of work in the AI community these days is integrative in one sense or another. Estimation of Distribution Algorithms integrate probabilistic reasoning with evolutionary learning [Pel05]. Markov Logic Networks [RD06] integrate formal logic and probabilistic inference, as does the Probabilistic Logic Networks framework [GIGH08] utilized in CogPrime and explained further in the book, and other works in the "Progic" area such as [WW06]. Leslie Pack Kaelbling has synthesized low-level robotics methods (particle filtering) with logical inference [ZPK07]. Dozens of further examples could be given. The construction of practical robotic systems like the Stanley system that won the DARPA Grand Challenge [Tea06] involve the integration of numerous components based on different principles. These algorithmic and pragmatic innovations provide ample raw materials for the construction of integrative cognitive architectures and are part of the reason why childlike AGI is more approachable now than it was 50 or even 10 years ago.

Further, many of the *cognitive architectures* described in the current AI literature are "integrative" in the sense of combining multiple, qualitatively different, interoperating algorithms. Chapter 4 gives a high-level overview of existing cognitive architectures, dividing them into *symbolic*, *emergentist* (e.g. neural network) and *hybrid* architectures. The hybrid architectures generally integrate symbolic and neural components, often with multiple subcomponents within each of these broad categories. However, we believe that even these excellent architectures are not integrative enough, in the sense that they lack sufficiently rich and nuanced interactions

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between the learning components associated with different kinds of memory, and hence are unlikely to give rise to the emergent structures and dynamics characterizing general intelligence. One of the central ideas underlying CogPrime is that with an integrative cognitive architecture that combines multiple aspects of intelligence, achieved by diverse structures and algorithms, within a common framework designed specifically to support robust **synergetic interactions** between these aspects.

The simplest way to create an integrative AI architecture is to loosely couple multiple components carrying out various functions, in such a way that the different components pass inputs and outputs amongst each other but do not interfere with or modulate each others' internal functioning in real-time. However, the human brain appears to be integrative in a much tighter sense, involving rich real-time dynamical coupling between various components with distinct but related functions. In [Goe09a] we have hypothesized that the brain displays a property of **cognitive synergy**, according to which multiple learning processes can not only **dispatch subproblems** to each other, but also **share contextual understanding in real-time**, so that each one can get help from the others in a contextually savvy way. By imbuing AI architectures with cognitive synergy, we hypothesize, one can get past the bottlenecks that have plagued AI in the past. Part of the reasoning here, as elaborated in Chapter 9 and [Goe09b], is that real physical and social environments display a rich dynamic interconnection between their various aspects, so that richly dynamically interconnected integrative AI architectures will be able to achieve goals within them more effectively.

And this brings us to the patternist perspective on intelligent systems, alluded to above and fleshed out further in Chapter 3 with its focus on the emergence of hierarchically and heterarchically structured networks of patterns, and pattern-systems modeling self and others. Ultimately the purpose of cognitive synergy in an AGI system is to enable the various AI algorithms and structures composing the system to work together effectively enough to give rise to the right *system-wide emergent structures* characterizing real-world general intelligence. The underlying theory is that intelligence is not reliant on any particular structure or algorithm, but *is* reliant on the emergence of appropriately structured networks of patterns, which can then be used to guide ongoing dynamics of pattern recognition and creation. And the underlying hypothesis is that the emergence of these structures cannot be achieved by a loosely interconnected assemblage of components, no matter how sensible the architecture; it requires a tightly connected, synergetic system.

It is possible to make these theoretical ideas about cognition mathematically rigorous; for instance, Appendix **??** briefly presents a formal definition of cognitive synergy that has been analyzed as part of an effort to prove theorems about the importance of cognitive synergy for giving rise to emergent system properties associated with general intelligence. However, while we have found such formal analyses valuable for clarifying our designs and understanding their qualitative properties, we have concluded that, for the present, the best way to explore our hypotheses about cognitive synergy and human-like general intelligence is empirically – via building and testing systems like CogPrime.

2.5.1 Achieving Humanlike Intelligence via Cognitive Synergy

Summing up: at the broadest level, there are four primary challenges in constructing an integrative, cognitive synergy based approach to AGI:

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1. choosing an **overall cognitive architecture** that possesses adequate richness and flexibility for the task of achieving childlike cognition.
2. Choosing **appropriate AI algorithms and data structures** to fulfill each of the functions identified in the cognitive architecture (e.g. visual perception, audition, episodic memory, language generation, analogy,...)
3. Ensuring that these algorithms and structures, within the chosen cognitive architecture, are able to cooperate in such a way as to provide appropriate **coordinated, synergetic intelligent behavior** (a critical aspect since childlike cognition is an integrated functional response to the world, rather than a loosely coupled collection of capabilities.)
4. Embedding one's system in an environment that provides **sufficiently rich stimuli and interactions** to enable the system to use this cooperation to ongoingly, creatively develop an intelligent internal world-model and self-model.

We argue that CogPrime
provides a viable way to address these challenges.

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Fig. 2.1: The Nao humanoid robot

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Fig. 2.2: The Nao humanoid robot

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Chapter 3
A Patternist Philosophy of Mind

3.1 Introduction

In the last chapter we discussed human intelligence from a fairly down-to-earth perspective, looking at the particular intelligent functions that human beings carry out in their everyday lives. And we strongly feel this practical perspective is important: Without this concreteness, it's too easy for AGI research to get distracted by appealing (or frightening) abstractions of various sorts. However, it's **also** important to look at the nature of mind and intelligence from a more general and conceptual perspective, to avoid falling into an approach that follows the particulars of human capability but ignores the deeper structures and dynamics of mind that ultimately allow human minds to be so capable. In this chapter we very briefly review some ideas from the **patternist philosophy of mind**, a general conceptual framework on intelligence which has been inspirational for many key aspects of the CogPrime design, and which has been ongoingly developed by one of the authors (Ben Goertzel) during the last two decades (in a series of publications beginning in 1991, most recently *The Hidden Pattern* [Goe06a]). Some of the ideas described are quite broad and conceptual, and are related to CogPrime only via serving as general inspirations; others are more concrete and technical, and are actually utilized within the design itself.

CogPrime is an integrative design formed via the combination of a number of different philosophical, scientific and engineering ideas. The success or failure of the design doesn't depend on any particular philosophical understanding of intelligence. In that sense, the more abstract notions presented in this chapter should be considered "optional" rather than critical in a CogPrime context. However, due to the core role patternism has played in the development of CogPrime, understanding a few things about general patternist philosophy will be helpful for understanding CogPrime, even for those readers who are not philosophically inclined. Those readers who *are* philosophically inclined, on the other hand, are urged to read *The Hidden Pattern* and then interpret the particulars of CogPrime in this light.

3.2 Some Patternist Principles

The patternist philosophy of mind is a general approach to thinking about intelligent systems. It is based on the very simple premise that mind is made of pattern – and that a mind is a

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system for recognizing patterns in itself and the world, critically including patterns regarding which procedures are likely to lead to the achievement of which goals in which contexts.

Pattern as the basis of mind is not in itself is a very novel idea; this concept is present, for instance, in the 19th-century philosophy of Charles Peirce [Pei34], in the writings of contemporary philosophers Daniel Dennett [Den91] and Douglas Hofstadter [Hof79, Hof96], in Benjamin Whorf's [Who64] linguistic philosophy and Gregory Bateson's [Bat79] systems theory of mind and nature. Bateson spoke of the Metapattern: "that it is pattern which connects." In Goertzel's writings on philosophy of mind, an effort has been made to pursue this theme more thoroughly than has been done before, and to articulate in detail how various aspects of human mind and mind in general can be well-understood by explicitly adopting a patternist perspective. [1]

In the patternist perspective, "pattern" is generally defined as "representation as something simpler." Thus, for example, if one measures simplicity in terms of bit-count, then a program compressing an image would be a pattern in that image. But if one uses a simplicity measure incorporating run-time as well as bit-count, then the compressed version may or may not be a pattern in the image, depending on how one's simplicity measure weights the two factors. This definition encompasses simple repeated patterns, but also much more complex ones. While pattern theory has typically been elaborated in the context of computational theory, it is not intrinsically tied to computation; rather, it can be developed in any context where there is a notion of "representation" or "production" and a way of measuring simplicity. One just needs to be able to assess the extent to which f represents or produces X, and then to compare the simplicity of f and X; and then one can assess whether f is a pattern in X. A formalization of this notion of pattern is given in [Goe06a] and briefly summarized at the end of this chapter.

Next, in patternism the mind of an intelligent system is conceived as the (fuzzy) set of patterns in that system, and the set of patterns emergent between that system and other systems with which it interacts. The latter clause means that the patternist perspective is inclusive of notions of distributed intelligence [Hut96]. Basically, the mind of a system is the fuzzy set of different simplifying representations of that system that may be adopted.

Intelligence is conceived, similarly to in Marcus Hutter's [Hut05] recent work (and as elaborated informally in Chapter 2 above, and formally in Chapter 7 below), as the ability to achieve complex goals in complex environments; where complexity itself may be defined as the possession of a rich variety of patterns. A mind is thus a collection of patterns that is associated with a persistent dynamical process that achieves highly-patterned goals in highly-patterned environments.

An additional hypothesis made within the patternist philosophy of mind is that reflection is critical to intelligence. This lets us conceive an intelligent system as a dynamical system that recognizes patterns in its environment and itself, as part of its quest to achieve complex goals.

While this approach is quite general, it is not vacuous; it gives a particular structure to the tasks of analyzing and synthesizing intelligent systems. About any would-be intelligent system, we are led to ask questions such as:

- How are patterns represented in the system? That is, how does the underlying infrastructure of the system give rise to the displaying of a particular pattern in the system's behavior?
- What kinds of patterns are most compactly represented within the system?
- What kinds of patterns are most simply learned?

[1] In some prior writings the term "psynet model of mind" has been used to refer to the application of patternist philosophy to cognitive theory, but this term has been "deprecated" in recent publications as it seemed to introduce more confusion than clarification.

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- What learning processes are utilized for recognizing patterns?
- What mechanisms are used to give the system the ability to introspect (so that it can recognize patterns in itself)?

Now, these same sorts of questions could be asked if one substituted the word "pattern" with other words like "knowledge" or "information". However, we have found that asking these questions in the context of pattern leads to more productive answers, avoiding unproductive byways and also tying in very nicely with the details of various existing formalisms and algorithms for knowledge representation and learning.

Among the many kinds of patterns in intelligent systems, *semiotic* patterns are particularly interesting ones. Peirce decomposed these into three categories:

- **iconic** patterns, which are patterns of contextually important internal similarity between two entities (e.g. an iconic pattern binds a picture of a person to that person)
- **indexical** patterns, which are patterns of spatiotemporal co-occurrence (e.g. an indexical pattern binds a wedding dress and a wedding)
- **symbolic** patterns, which are patterns indicating that two entities are often involved in the same relationships (e.g. a symbolic pattern between the number "5" (the symbol) and various sets of 5 objects (the entities that the symbol is taken to represent))

Of course, some patterns may span more than one of these semiotic categories; and there are also some patterns that don't fall neatly into any of these categories. But the semiotic patterns are particularly important ones; and symbolic patterns have played an especially large role in the history of AI, because of the radically different approaches different researchers have taken to handling them in their AI systems. Mathematical logic and related formalisms provide sophisticated mechanisms for combining and relating symbolic patterns ("symbols"), and some AI approaches have focused heavily on these, sometimes more so than on the identification of symbolic patterns in experience or the use of them to achieve practical goals. We will look fairly carefully at these differences in Chapter 4.

Pursuing the patternist philosophy in detail leads to a variety of particular hypotheses and conclusions about the nature of mind. Following from the view of intelligence in terms of achieving complex goals in complex environments, comes a view in which the dynamics of a cognitive system are understood to be governed by two main forces:

- self-organization, via which system dynamics cause existing system patterns to give rise to new ones
- goal-oriented behavior, which will be defined more rigorously in Chapter 7, but basically amounts to a system interacting with its environment in a way that appears like an attempt to maximize some reasonably simple function

Self-organized and goal-oriented behavior must be understood as cooperative aspects. If an agent is asked to build a surprising structure out of blocks and does so, this is goal-oriented. But the agent's ability to carry out this goal-oriented task will be greater if it has previously played around with blocks a lot in an unstructured, spontaneous way. And the "nudge toward creativity" given to it by asking it to build a surprising blocks structure may cause it to explore some novel patterns, which then feed into its future unstructured blocks play.

Based on these concepts, as argued in detail in [Goe06a], several primary dynamical principles may be posited, including:

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- **Evolution** , conceived as a general process via which patterns within a large population thereof are differentially selected and used as the basis for formation of new patterns, based on some "fitness function" that is generally tied to the goals of the agent
  - *Example:* If trying to build a blocks structure that will surprise Bob, an agent may simulate several procedures for building blocks structures in its "mind's eye", assessing for each one the expected degree to which it might surprise Bob. The search through procedure space could be conducted as a form of evolution, via an algorithm such as MOSES.
- **Autopoiesis**: the process by which a system of interrelated patterns maintains its integrity, via a dynamic in which whenever one of the patterns in the system begins to decrease in intensity, some of the other patterns increase their intensity in a manner that causes the troubled pattern to increase in intensity again
  - *Example:* An agent's set of strategies for building the base of a tower, and its set of strategies for building the middle part of a tower, are likely to relate autopoietically. If the system partially forgets how to build the base of a tower, then it may regenerate this missing knowledge via using its knowledge about how to build the middle part (i.e., it knows it needs to build the base in a way that will support good middle parts). Similarly if it partially forgets how to build the middle part, then it may regenerate this missing knowledge via using its knowledge about how to build the base (i.e. it knows a good middle part should fit in well with the sorts of base it knows are good).
  - This same sort of interdependence occurs between pattern-sets containing more than two elements
  - Sometimes (as in the above example) autopoietic interdependence in the mind is tied to interdependencies in the physical world, sometimes not.
- **Association**. Patterns, when given attention, spread some of this attention to other patterns that they have previously been associated with in some way. Furthermore, there is Peirce's law of mind [Pei34], which could be paraphrased in modern terms as stating that the mind is an associative memory network, whose dynamics dictate that every idea in the memory is an active agent, continually acting on those ideas with which the memory associates it.
  - *Example:* Building a blocks structure that resembles a tower, spreads attention to memories of prior towers the agents has seen, and also to memories of people the agent knows have seen towers, and structures it has built at the same time as towers, structures that resemble towers in various respects, etc.
- **Differential attention allocation / credit assignment**. Patterns that have been valuable for goal-achievement are given more attention, and are encouraged to participate in giving rise to new patterns.
  - *Example:* Perhaps in a prior instance of the task "build me a surprising structure out of blocks," searching through memory for non-blocks structures that the agent has played with has proved a useful cognitive strategy. In that case, when the task is posed to the agent again, it should tend to allocate disproportionate resources to this strategy.
- **Pattern creation**. Patterns that have been valuable for goal-achievement are mutated and combined with each other to yield new patterns.

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- *Example:* Building towers has been useful in a certain context, but so has building structures with a large number of triangles. Why not build a tower out of triangles? Or maybe a vaguely tower-like structure that uses more triangles than a tower easily could?
- *Example:* Building an elongated block structure resembling a table was successful in the past, as was building a structure resembling a very flat version of a chair. Generalizing, maybe building distorted versions of furniture is good. Or maybe it is building distorted version of *any* previously perceived objects that is good. Or maybe both, to different degrees....

Next, for a variety of reasons outlined in [Goe06a] it becomes appealing to hypothesize that the network of patterns in an intelligent system must give rise to the following large-scale emergent structures

- Hierarchical network. Patterns are habitually in relations of control over other patterns that represent more specialized aspects of themselves.
  - *Example:* The pattern associated with "tall building" has some control over the pattern associated with "tower", as the former represents a more general concept ... and "tower" has some control over "Eiffel tower", etc.
- Heterarchical network. The system retains a memory of which patterns have previously been associated with each other in any way.
  - *Example:* "Tower" and "snake" are distant in the natural pattern hierarchy, but may be associatively/heterarchically linked due to having a common elongated structure. This heterarchical linkage may be used for many things, e.g. it might inspire the creative construction of a tower with a snake's head.
- Dual network. Hierarchical and heterarchical structures are combined, with the dynamics of the two structures working together harmoniously. Among many possible ways to hierarchically organize a set of patterns, the one used should be one that causes hierarchically nearby patterns to have many meaningful heterarchical connections; and of course, there should be a tendency to search for heterarchical connections among hierarchically nearby patterns.
  - *Example:* While the set of patterns hierarchically nearby "tower" and the set of patterns heterarchically nearby "tower" will be quite different, they should still have more overlap than random pattern-sets of similar sizes. So, if looking for something else heterarchically near "tower", using the hierarchical information about "tower" should be of some use, and vice versa.
  - In PLN, hierarchical relationships correspond to Atoms A and B so that $InheritanceAB$ and $InheritanceBA$ have highly dissimilar strength; and heterarchical relationships correspond to IntensionalSimilarity relationships. The dual network structure then arises when intensional and extensional inheritance approximately correlate with each other, so that inference about either kind of inheritance assists with figuring out about the other kind.
- Self structure. A portion of the network of patterns forms into an approximate image of the overall network of patterns.

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- *Example:* Each time the agent builds a certain structure, it observes itself building the structure, and its role as "builder of a tall tower" (or whatever the structure is) becomes part of its self-model. Then when it is asked to build something new, it may consult its self-model to see if it believes itself capable of building that sort of thing (for instance, if it is asked to build something very large, its self-model may tell it that it lacks persistence for such projects, so it may reply "I can try, but I may wind up not finishing it").

As we proceed through the CogPrime design in the following pages, we will see how each of these abstract concepts arises concretely from CogPrime's structures and algorithms. If the theory of [Goe06a] is correct, then the success of CogPrime as a design will depend largely on whether these high-level structures and dynamics can be made to emerge from the synergetic interaction of CogPrime's representation and algorithms, when they are utilized to control an appropriate agent in an appropriate environment.

3.3 Cognitive Synergy

Now we dig a little deeper and present a different sort of "general principle of feasible general intelligence", already hinted in earlier chapters: the *cognitive synergy* principle [2], which is both a conceptual hypothesis about the structure of generally intelligent systems in certain classes of environments, and a design principle used to guide the design of CogPrime. Chapter 8 presents a mathematical formalization of the notion of cognitive synergy; here we present the conceptual idea informally, which makes it more easily digestible but also more vague-sounding.

We will focus here on cognitive synergy specifically in the case of "multi-memory systems," which we define as intelligent systems whose combination of environment, embodiment and motivational system make it important for them to possess memories that divide into partially but not wholly distinct components corresponding to the categories of:

- Declarative memory
  - *Examples of declarative knowledge:* Towers on average are taller than buildings. I generally am better at building structures I imagine, than at imitating structures I'm shown in pictures.
- Procedural memory (memory about how to do certain things)
  - *Examples of procedural knowledge:* Practical know-how regarding how to pick up an elongated rectangular block, or a square one. Know-how regarding when to approach a problem by asking "What would one of my teachers do in this situation" versus by thinking through the problem from first principles.
- Sensory and episodic memory
  - *Example of sensory knowledge:* memory of Bob's face; memory of what a specific tall blocks tower looked like

[2] While these points are implicit in the theory of mind given in [Goe06a], they are not articulated in this specific form there. So the material presented in this section is a new development within patternist philosophy, developed since [Goe06a] in a series of conference papers such as [Goe09a].

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  - *Example of episodic knowledge:* memory of the situation in which the agent first met Bob; memory of a situation in which a specific tall blocks tower was built

- Attentional memory (knowledge about what to pay attention to in what contexts)
  - *Example of attentional knowledge:* When involved with a new person, it's useful to pay attention to whatever that person looks at

- Intentional memory (knowledge about the system's own goals and subgoals)
  - *Example of intentional knowledge:* If my goal is to please some person whom I don't know that well, then a subgoal may be figuring out what makes that person smile.

In Chapter 9 below we present a detailed argument as to how the requirement for a multi-memory underpinning for general intelligence emerges from certain underlying assumptions regarding the measurement of the simplicity of goals and environments. Specifically we argue that each of these memory types corresponds to certain *modes of communication*, so that intelligent agents which have to efficiently handle a sufficient variety of types of communication with other agents, are going to have to handle all these types of memory. These types of communication overlap and are often used together, which implies that the different memories and their associated cognitive processes need to work together. The points made in this section do not rely on that argument regarding the relation of multiple memory types to the environmental situation of multiple communication types. What they do rely on is the assumption that, in the intelligence agent in question, the different components of memory are significantly but not wholly distinct. That is, there are significant "family resemblances" between the memories of a single type, yet there are also thoroughgoing connections between memories of different types.

Repeating the above points in a slightly more organized manner and then extending them, the essential idea of cognitive synergy, in the context of multi-memory systems, may be expressed in terms of the following points

1. Intelligence, relative to a certain set of environments, may be understood as the capability to achieve complex goals in these environments.
2. With respect to certain classes of goals and environments, an intelligent system requires a "multi-memory" architecture, meaning the possession of a number of specialized yet interconnected knowledge types, including: declarative, procedural, attentional, sensory, episodic and intentional (goal-related). These knowledge types may be viewed as different sorts of patterns that a system recognizes in itself and its environment.
3. Such a system must possess knowledge creation (i.e. pattern recognition / formation) mechanisms corresponding to each of these memory types. These mechanisms are also called "cognitive processes."
4. Each of these cognitive processes, to be effective, must have the capability to recognize when it lacks the information to perform effectively on its own; and in this case, to dynamically and interactively draw information from knowledge creation mechanisms dealing with other types of knowledge
5. This cross-mechanism interaction must have the result of enabling the knowledge creation mechanisms to perform much more effectively in combination than they would if operated non-interactively. This is "cognitive synergy."

Interactions as mentioned in Points 4 and 5 in the above list are the real conceptual meat of the cognitive synergy idea. One way to express the key idea here, in an AI context, is that

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most AI algorithms suffer from combinatorial explosions: the number of possible elements to be combined in a synthesis or analysis is just too great, and the algorithms are unable to filter through all the possibilities, given the lack of intrinsic constraint that comes along with a "general intelligence" context (as opposed to a narrow-AI problem like chess-playing, where the context is constrained and hence restricts the scope of possible combinations that needs to be considered). In an AGI architecture based on cognitive synergy, the different learning mechanisms must be designed specifically to interact in such a way as to palliate each others' combinatorial explosions - so that, for instance, each learning mechanism dealing with a certain sort of knowledge, must synergize with learning mechanisms dealing with the other sorts of knowledge, in a way that decreases the severity of combinatorial explosion.

One prerequisite for cognitive synergy to work is that each learning mechanism must recognize when it is "stuck," meaning it's in a situation where it has inadequate information to make a confident judgment about what steps to take next. Then, when it does recognize that it's stuck, it may request help from other, complementary cognitive mechanisms.

3.4 The General Structure of Cognitive Dynamics: Analysis and Synthesis

We have discussed the need for synergetic interrelation between cognitive processes corresponding to different types of memory ... and the general high-level cognitive dynamics that a mind must possess (evolution, autopoiesis). The next step is to dig further into the nature of the cognitive processes associated with different memory types and how they give rise to the needed high-level cognitive dynamics. In this section we present a *general theory of cognitive processes* based on a decomposition of cognitive processes into the two categories of *analysis* and *synthesis*, and a general formulation of each of these categories [3].

Specifically we focus here on what we call *focused cognitive processes*; that is, cognitive processes that selectively focus attention on a subset of the patterns making up a mind. In general these are not the only kind, there may also be *global cognitive processes* that act on every pattern in a mind. An example of a global cognitive process in CogPrime is the basic attention allocation process, which spreads "importance" among all knowledge in the system's memory. Global cognitive processes are also important, but focused cognitive processes are subtler to understand which is why we spend more time on them here.

3.4.1 Component-Systems and Self-Generating Systems

We begin with autopoesis – and, more specifically, with the concept of a "component-system", as described in George Kampis's book *Self-Modifying Systems in Biology and Cognitive Science* [Kam91], and as modified into the concept of a "self-generating system" or SGS in Goertzel's book *Chaotic Logic* [Goe94]. Roughly speaking, a Kampis-style component-system consists of a set of components that combine with each other to form other compound components. The

[3] While these points are highly compatible with theory of mind given in [Goe06a], they are not articulated there. The material presented in this section is a new development within patternist philosophy, presented previously only in the article [GPPG06].

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metaphor Kampis uses is that of Lego blocks, combining to form bigger Lego structures. Compound structures may in turn be combined together to form yet bigger compound structures. A self-generating system is basically the same concept as a component-system, but understood to be computable, whereas Kampis claims that component-systems are uncomputable.

Next, in SGS theory there is also a notion of reduction (not present in the Lego metaphor): sometimes when components are combined in a certain way, a "reaction" happens, which may lead to the elimination of some of the components. One relevant metaphor here is chemistry. Another is abstract algebra: for instance, if we combine a component f with its "inverse" component f^{-1}, both components are eliminated. Thus, we may think about two stages in the interaction of sets of components: combination, and reduction. Reduction may be thought of as algebraic simplification, governed by a set of rules that apply to a newly created compound component, based on the components that are assembled within it.

Formally, suppose $C_1, C_2, ...$ is the set of components present in a discrete-time component-system at time t. Then, the components present at time $t+1$ are a subset of the set of components of the form

$$Reduce(Join(C_i(1), ..., C_i(r)))$$

where *Join* is a joining operation, and *Reduce* is a reduction operator. The joining operation is assumed to map tuples of components into components, and the reduction operator is assumed to map the space of components into itself. Of course, the specific nature of a component system is totally dependent on the particular definitions of the reduction and joining operators; in following chapters we will specify these for the CogPrime system, but for the purpose of the broader theoretical discussion in this section they may be left general.

What is called the "cognitive equation" in *Chaotic Logic* [Goe94] is the case of a SGS where the patterns in the system at time t have a tendency to correspond to components of the system at future times $t + s$. So, part of the action of the system is to transform implicit knowledge (patterns among system components) into explicit knowledge (specific system components). We will see one version of this phenomenon in Chapter 14 where we model implicit knowledge using mathematical structures called "derived hypergraphs"; and we will also later review several ways in which CogPrime's dynamics explicitly encourage cognitive-equation type dynamics, e.g.:

- inference, which takes conclusions implicit in the combination of logical relationships, and makes them implicit by deriving new logical relationships from them
- map formation, which takes concepts that have often been active together, and creates new concepts grouping them
- association learning, which creates links representing patterns of association between entities
- probabilistic procedure learning, which creates new models embodying patterns regarding which procedures tend to perform well according to particular fitness functions

3.4.2 Analysis and Synthesis

Now we move on to the main point of this section: the argument that all or nearly all focused cognitive processes are expressible using two general process-schemata we call *synthesis* and

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analysis [4]. The notion of "focused cognitive process" will be exemplified more thoroughly below, but in essence what is meant is a cognitive process that begins with a small number of items (drawn from memory) as its focus, and has as its goal discovering something about these items, or discovering something about something else in the context of these items or in a way strongly biased by these items. This is different from a global cognitive process whose goal is more broadly-based and explicitly involves all or a large percentage of the knowledge in an intelligent system's memory store.

Among the focused cognitive processes are those governed by the so-called *cognitive schematic* implication

$$Context \wedge Procedure \rightarrow Goal$$

where the Context involves sensory, episodic and/or declarative knowledge; and attentional knowledge is used to regulate how much resource is given to each such schematic implication in memory. Synergy among the learning processes dealing with the context, the procedure and the goal is critical to the adequate execution of the cognitive schematic using feasible computational resources. This sort of explicitly goal-driven cognition plays a significant though not necessarily dominant role in CogPrime, and is also related to production rules systems and other traditional AI systems, as will be articulated in Chapter 4.

The synthesis and analysis processes as we conceive them, in the general framework of SGS theory, are as follows. First, synthesis, as shown in Figure 3.1, is defined as

synthesis: Iteratively build compounds from the initial component pool using the combinators, greedily seeking compounds that seem likely to achieve the goal.

Or in more detail:

1. Begin with some initial components (the initial "current pool"), an additional set of components identified as "combinators" (combination operators), and a goal function
2. Combine the components in the current pool, utilizing the combinators, to form product components in various ways, carrying out reductions as appropriate, and calculating relevant quantities associated with components as needed
3. Select the product components that seem most promising according to the goal function, and add these to the current pool (or else simply define these as the current pool)
4. Return to Step 2

And analysis, as shown in Figure 3.2, is defined as

analysis: Iteratively search (the system's long-term memory) for component-sets that combine using the combinators to form the initial component pool (or subsets thereof), greedily seeking component-sets that seem likely to achieve the goal

or in more detail:

1. Begin with some components (the initial "current pool") and a goal function
2. Seek components so that, if one combines them to form product components using the combinators and then performs appropriate reductions, one obtains (as many as possible of) the components in the current pool

[4] In [GPPG06], what is here called "analysis" was called "backward synthesis", a name which has some advantages since it indicated that what's happening is a form of creation; but here we have opted for the more traditional analysis/synthesis terminology

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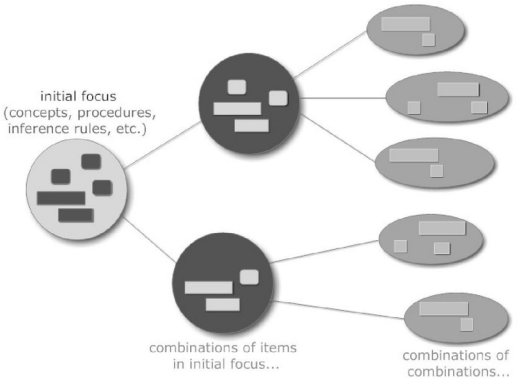

Fig. 3.1: The General Process of Synthesis

3. Use the newly found constructions of the components in the current pool, to update the quantitative properties of the components in the current pool, and also (via the current pool) the quantitative properties of the components in the initial pool
4. Out of the components found in Step 2, select the ones that seem most promising according to the goal function, and add these to the current pool (or else simply define these as the current pool)
5. Return to Step 2

More formally, synthesis may be specified as follows. Let X denote the set of combinators, and let Y_0 denote the initial pool of components (the initial focus of the cognitive process). Given Y_i, let Z_i denote the set

$$Reduce(Join(C_i(1), ..., C_i(r)))$$

where the C_i are drawn from Y_i or from X. We may then say
$Y_{i+1} = Filter(Z_i)$
where $Filter$ is a function that selects a subset of its arguments.

Analysis, on the other hand, begins with a set W of components, and a set X of combinators, and tries to find a series Y_i so that according to the process of synthesis, Y_n=W.

In practice, of course, the implementation of a synthesis process need not involve the explicit construction of the full set Z_i. Rather, the filtering operation takes place implicitly during the construction of Y_{i+1}. The result, however, is that one gets some subset of the compounds producible via joining and reduction from the set of components present in Y_i plus the combinators X.

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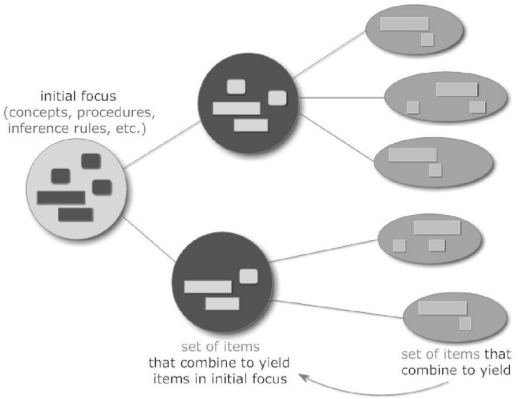

Fig. 3.2: The General Process of Analysis

Conceptually one may view synthesis as a very generic sort of "growth process," and analysis as a very generic sort of "figuring out how to grow something." The intuitive idea underlying the present proposal is that these forward-going and backward-going "growth processes" are among the essential foundations of cognitive control, and that a conceptually sound design for cognitive control should explicitly make use of this fact. To abstract away from the details, what these processes are about is:

- taking the general dynamic of compound-formation and reduction as outlined in Kampis and *Chaotic Logic*
- introducing goal-directed pruning ("filtering") into this dynamic so as to account for the limitations of computational resources that are a necessary part of pragmatic intelligence

3.4.3 The Dynamic of Iterative Analysis and Synthesis

While synthesis and analysis are both very useful on their own, they achieve their greatest power when harnessed together. It is my hypothesis that the dynamic pattern of alternating synthesis and analysis has a fundamental role in cognition. Put simply, synthesis creates new mental forms by combining existing ones. Then, analysis seeks simple explanations for the forms in the mind, including the newly created ones; and, this explanation itself then comprises additional new forms in the mind, to be used as fodder for the next round of synthesis. Or, to put it yet more simply:

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⇒ **Combine** ⇒ **Explain** ⇒ **Combine** ⇒ **Explain** ⇒ **Combine** ⇒

It is not hard to express this alternating dynamic more formally, as well.

- Let X denote any set of components.
- Let F(X) denote a set of components which is the result of synthesis on X.
- Let B(X) denote a set of components which is the result of analysis of X. We assume also a heuristic biasing the synthesis process toward simple constructs.
- Let S(t) denote a set of components at time t, representing part of a system's knowledge base.
- Let I(t) denote components resulting from the external environment at time t.

Then, we may consider a dynamical iteration of the form

$$S(t+1) = B(F(S(t) + I(t)))$$

This expresses the notion of alternating synthesis and analysis formally, as a dynamical iteration on the space of sets of components. We may then speak about attractors of this iteration: fixed points, limit cycles and strange attractors. One of the key hypotheses I wish to put forward here is that some key emergent cognitive structures are strange attractors of this equation. The iterative dynamic of combination and explanation leads to the emergence of certain complex structures that are, in essence, maintained when one recombines their parts and then seeks to explain the recombinations. These structures are built in the first place through iterative recombination and explanation, and then survive in the mind because they are conserved by this process. They then ongoingly guide the construction and destruction of various other temporary mental structures that are not so conserved.

3.4.4 Self and Focused Attention as Approximate Attractors of the Dynamic of Iterated Forward-Analysis

As noted above, patternist philosophy argues that two key aspects of intelligence are emergent structures that may be called the "self" and the "attentional focus." These, it is suggested, are aspects of intelligence that may not effectively be wired into the infrastructure of an intelligent system, though of course the infrastructure may be configured in such a way as to encourage their emergence. Rather, these aspects, by their nature, are only likely to be effective if they emerge from the cooperative activity of various cognitive processes acting within a broad base of knowledge.

Above we have described the pattern of ongoing habitual oscillation between synthesis and analysis as a kind of "dynamical iteration." Here we will argue that both self and attentional focus may be viewed as strange attractors of this iteration. The mode of argument is relatively informal. The essential processes under consideration are ones that are poorly understood from an empirical perspective, due to the extreme difficulty involved in studying them experimentally. For understanding self and attentional focus, we are stuck in large part with introspection, which is famously unreliable in some contexts, yet still dramatically better than having no information at all. So, the philosophical perspective on self and attentional focus given here is a synthesis of empirical and introspective notions, drawn largely from the published thinking and research of

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others but with a few original twists. From a CogPrime perspective, its use has been to guide the design process, to provide a grounding for what otherwise would have been fairly arbitrary choices.

3.4.4.1 Self

Another high-level intelligent system pattern mentioned above is the "self", which we here will tie in with analysis and synthesis processes. The term "self" as used here refers to the "phenomenal self" [Met04] or "self-model". That is, the self is the model that a system builds internally, reflecting the patterns observed in the (external and internal) world that directly pertain to the system itself. As is well known in everyday human life, self-models need not be completely accurate to be useful; and in the presence of certain psychological factors, a more accurate self-model may not necessarily be advantageous. But a self-model that is too badly inaccurate will lead to a badly-functioning system that is unable to effectively act toward the achievement of its own goals.

The value of a self-model for any intelligent system carrying out embodied agentive cognition is obvious. And beyond this, another primary use of the self is as a foundation for metaphors and analogies in various domains. Patterns recognized pertaining to the self are analogically extended to other entities. In some cases this leads to conceptual pathologies, such as the anthropomorphization of trees, rocks and other such objects that one sees in some precivilized cultures. But in other cases this kind of analogy leads to robust sorts of reasoning - for instance, in reading Lakoff and Nunez's [LN00] intriguing explorations of the cognitive foundations of mathematics, it is pretty easy to see that most of the metaphors on which they hypothesize mathematics to be based, are grounded in the mind's conceptualization of itself as a spatiotemporally embedded entity, which in turn is predicated on the mind's having a conceptualization of itself (a self) in the first place.

A self-model can in many cases form a self-fulfilling prophecy (to make an obvious double-entendre'!). Actions are generated based on one's model of what sorts of actions one can and/or should take; and the results of these actions are then incorporated into one's self-model. If a self-model proves a generally bad guide to action selection, this may never be discovered, unless said self-model includes the knowledge that semi-random experimentation is often useful.

In what sense, then, may it be said that self is an attractor of iterated analysis? Analysis infers the self from observations of system behavior. The system asks: What kind of system might I be, in order to give rise to these behaviors that I observe myself carrying out? Based on asking itself this question, it constructs a model of itself, i.e. it constructs a self. Then, this self guides the system's behavior: it builds new logical relationships its self-model and various other entities, in order to guide its future actions oriented toward achieving its goals. Based on the behaviors newly induced via this constructive, forward-synthesis activity, the system may then engage in analysis again and ask: What must I be now, in order to have carried out these new actions? And so on.

Our hypothesis is that after repeated iterations of this sort, in infancy, finally during early childhood a kind of self-reinforcing attractor occurs, and we have a self-model that is resilient and doesn't change dramatically when new instances of action- or explanation-generation occur. This is not strictly a mathematical attractor, though, because over a long period of time the self may well shift significantly. But, for a mature self, many hundreds of thousands or millions of forward-analysis cycles may occur before the self-model is dramatically modified. For relatively

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long periods of time, small changes within the context of the existing self may suffice to allow the system to control itself intelligently.

Humans can also develop what are known as **subselves** [Row90]. A subself is a partially autonomous self-network focused on particular tasks, environments or interactions. It contains a unique model of the whole organism, and generally has its own set of episodic memories, consisting of memories of those intervals during which it was the primary dynamic mode controlling the organism. One common example is the **creative subself** – the subpersonality that takes over when a creative person launches into the process of creating something. In these times, a whole different personality sometimes emerges, with a different sort of relationship to the world. Among other factors, creativity requires a certain open-ness that is not always productive in an everyday life context, so it's natural for the self-system of a highly creative person to bifurcate into one self-system for everyday life, and another for the protected context of creative activity. This sort of phenomenon might emerge naturally in CogPrime systems as well if they were exposed to appropriate environments and social situations.

Finally, it is interesting to speculate regarding how self may differ in future AI systems as opposed to in humans. The relative stability we see in human selves may not exist in AI systems that can self-improve and change more fundamentally and rapidly than humans can. There may be a situation in which, as soon as a system has understood itself decently, it radically modifies itself and hence violates its existing self-model. Thus: intelligence without a long-term stable self. In this case the "attractor-ish" nature of the self holds only over much shorter time scales than for human minds or human-like minds. But the alternating process of synthesis and analysis for self-construction is still critical, even though no reasonably stable self-constituting attractor ever emerges. The psychology of such intelligent systems will almost surely be beyond human beings' capacity for comprehension and empathy.

3.4.4.2 Attentional Focus

Finally, we turn to the notion of an "attentional focus" similar to Baars' [Baa97] notion of a Global Workspace, which will be reviewed in more detail in Chapter 4: a collection of mental entities that are, at a given moment, receiving far more than the usual share of an intelligent system's computational resources. Due to the amount of attention paid to items in the attentional focus, at any given moment these items are in large part driving the cognitive processes going on elsewhere in the mind as well - because the cognitive processes acting on the items in the attentional focus are often involved in other mental items, not in attentional focus, as well (and sometimes this results in pulling these other items into attentional focus). An intelligent system must constantly shift its attentional focus from one set of entities to another based on changes in its environment and based on its own shifting discoveries.

In the human mind, there is a self-reinforcing dynamic pertaining to the collection of entities in the attentional focus at any given point in time, resulting from the observation that: If A is in the attentional focus, and A and B have often been associated in the past, then odds are increased that B will soon be in the attentional focus. This basic observation has been refined tremendously via a large body of cognitive psychology work; and neurologically it follows not only from Hebb's [Heb49] classic work on neural reinforcement learning, but also from numerous more modern refinements [SB98]. But it implies that two items A and B, if both in the attentional focus, can reinforce each others' presence in the attentional focus, hence forming a kind of conspiracy to keep each other in the limelight. But of course, this kind of dynamic

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must be counteracted by a pragmatic tendency to remove items from the attentional focus if giving them attention is not providing sufficient utility in terms of the achievement of system goals.

The synthesis and analysis perspective provides a more systematic perspective on this self-reinforcing dynamic. Synthesis occurs in the attentional focus when two or more items in the focus are combined to form new items, new relationships, new ideas. This happens continually, as one of the main purposes of the attentional focus is combinational. On the other hand, Analysis then occurs when a combination that has been speculatively formed is then linked in with the remainder of the mind (the "unconscious", the vast body of knowledge that is not in the attentional focus at the given moment in time). Analysis basically checks to see what support the new combination has within the existing knowledge store of the system. Thus, forward-analysis basically comes down to "generate and test", where the testing takes the form of attempting to integrate the generated structures with the ideas in the unconscious long-term memory. One of the most obvious examples of this kind of dynamic is creative thinking (Boden, 2003; Goertzel, 1997), where the attentional focus continually combinationally creates new ideas, which are then tested via checking which ones can be validated in terms of (built up from) existing knowledge.

The analysis stage may result in items being pushed out of the attentional focus, to be replaced by others. Likewise may the synthesis stage: the combinations may overshadow and then replace the things combined. However, in human minds and functional AI minds, the attentional focus will not be a complete chaos with constant turnover: Sometimes the same set of ideas – or a shifting set of ideas within the same overall family of ideas – will remain in focus for a while. When this occurs it is because this set or family of ideas forms an approximate attractor for the dynamics of the attentional focus, in particular for the forward-analysis dynamic of speculative combination and integrative explanation. Often, for instance, a small "core set" of ideas will remain in the attentional focus for a while, but will not exhaust the attentional focus: the rest of the attentional focus will then, at any point in time, be occupied with other ideas related to the ones in the core set. Often this may mean that, for a while, the whole of the attentional focus will move around quasi-randomly through a "strange attractor" consisting of the set of ideas related to those in the core set.

3.4.5 Conclusion

The ideas presented above (the notions of synthesis and analysis, and the hypothesis of self and attentional focus as attractors of the iterative forward-analysis dynamic) are quite generic and are hypothetically proposed to be applicable to any cognitive system, natural or artificial. Later chapters will discuss the manifestation of the above ideas in the context of CogPrime. We have found that the analysis/synthesis approach is a valuable tool for conceptualizing CogPrime's cognitive dynamics, and we conjecture that a similar utility may be found more generally.

Next, so as not to end the section on too blasé of a note, we will also make a stronger hypothesis: that, in order for a physical or software system to achieve intelligence that is roughly human-level in both capability and generality, using computational resources on the same order of magnitude as the human brain, this system must

- manifest the dynamic of iterated synthesis and analysis, as modes of an underlying "self-generating system" dynamic

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- do so in such a way as to lead to self and attentional focus as emergent structures that serve as approximate attractors of this dynamic, over time periods that are long relative to the basic "cognitive cycle time" of the system's forward-analysis dynamics

To prove the truth of a hypothesis of this nature would seem to require mathematics fairly far beyond anything that currently exists. Nonetheless, however, we feel it is important to formulate and discuss such hypotheses, so as to point the way for future investigations both theoretical and pragmatic.

3.5 Perspectives on Machine Consciousness

Finally, we can't let a chapter on philosophy – even a brief one – end without some discussion of the thorniest topic in the philosophy of mind: consciousness. Rather than seeking to resolve or comprehensively review this most delicate issue, we will restrict ourselves to giving it in Appendix **??** an overview of many of the common views on the subject; and here in the main text discussing the relationship between consciousness theory and patternist philosophy of cognition, the practical work of designing and building AGI.

One fairly concrete idea about consciousness, that relates closely to certain aspects of the CogPrime design, is that the subjective experience of being conscious of some entity X, is correlated with the presence of a very intense pattern in one's overall mind-state, corresponding to X. This simple idea is also the essence of neuroscientist Susan Greenfield's theory of consciousness [Gre01] (but in her theory, "overall mind-state" is replaced with "brain-state"), and has much deeper historical roots in philosophy of mind which we shall not venture to unravel here.

This observation relates to the idea of "moving bubbles of awareness" in intelligent systems. If an intelligent system consists of multiple processing or data elements, and during each (sufficiently long) interval of time some of these elements get much more attention than others, then one may view the system as having a certain "attentional focus" during each interval. The attentional focus is itself a significant pattern in the system (the pattern being "these elements habitually get more processor and memory", roughly speaking). As the attentional focus shifts over time one has a "moving bubble of pattern" which then corresponds experientially to a "moving bubble of awareness."

This notion of a "moving bubble of awareness" ties in very closely to global workspace theory [Baa97] (briefly mentioned above), a cognitive theory that has broad support from neuroscience and cognitive science and has also served as the motivation for Stan Franklin's LIDA AI system [BF09], to be discussed in Chapter **??**. The global workspace theory views the mind as consisting of a large population of small, specialized processes – a society of agents. These agents organize themselves into coalitions, and coalitions that are relevant to contextually novel phenomena, or contextually important goals, are pulled into the global workspace (which is identified with consciousness). This workspace broadcasts the message of the coalition to all the unconscious agents, and recruits other agents into consciousness. Various sorts of contexts – e.g. goal contexts, perceptual contexts, conceptual contexts and cultural contexts – play a role in determining which coalitions are relevant, and form the unconscious "background" of the conscious global workspace. New perceptions are often, but not necessarily, pushed into the workspace. Some of the agents in the global workspace are concerned with action selection, i.e. with controlling and passing parameters to a population of possible actions. The contents of the workspace at any given time have a certain cohesiveness and interdependency, the so-called

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"unity of consciousness." In essence the contents of the global workspace form a moving bubble of attention or awareness.

In CogPrime, this moving bubble is achieved largely via economic attention network (ECAN) equations [GPI+10] that propagate virtual currency between nodes and links representing elements of memories, so that the attentional focus consists of the wealthiest nodes and links. Figures 3.3 and 3.4 illustrate the existence and flow of attentional focus in OpenCog. On the other hand, in Hameroff's recent model of the brain [Ham10], the brain's moving bubble of attention is achieved through dendro-dendritic connections and the emergent dendritic web.

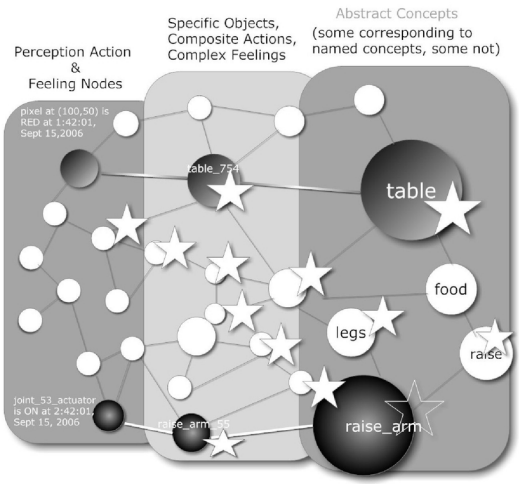

Fig. 3.3: Graphical depiction of the momentary bubble of attention in the memory of an OpenCog AI system. Circles and lines represent nodes and links in OpenCogPrimes memory, and stars denote those nodes with a high level of attention (represented in OpenCog by the ShortTermImportance node variable) at the particular point in time.

In this perspective, self, free will and reflective consciousness are specific phenomena occurring *within* the moving bubble of awareness. They are specific ways of experiencing awareness, corresponding to certain abstract types of physical structures and dynamics, which we shall endeavor to identify in detail in Appendix **??**.

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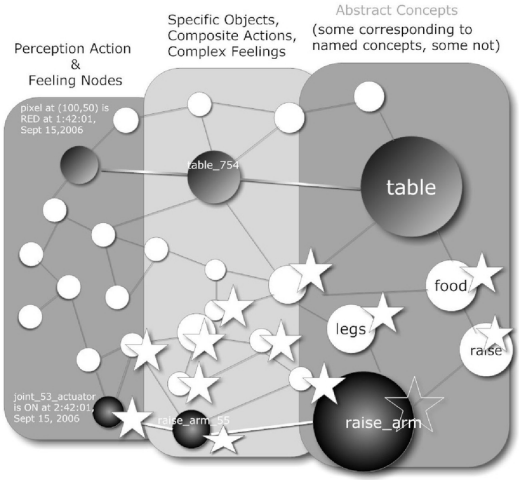

Fig. 3.4: Graphical depiction of the momentary bubble of attention in the memory of an OpenCog AI system, a few moments after the bubble shown in Figure 3.3, indicating the moving of the bubble of attention. Depictive conventions are the same as in Figure 1. This shows an idealized situation where the declarative knowledge remains invariant from one moment to the next but only the focus of attention shifts. In reality both will evolve together.

3.6 Postscript: Formalizing Pattern

Finally, before winding up our very brief tour through patternist philosophy of mind, we will briefly visit patternism's more formal side. Many of the key aspects of patternism have been rigorously formalized. Here we give only a few very basic elements of the relevant mathematics, which will be used later on in the exposition of CogPrime. (Specifically, the formal definition of pattern emerges in the CogPrime design in the definition of a fitness function for "pattern mining" algorithms and Occam-based concept creation algorithms, and the definition of intensional inheritance within PLN.)

We give some definitions, drawn from Appendix 1 of [Goe06a]:

Definition 1 *Given a metric space (M, d), and two functions $c : M \to [0, \infty]$ (the "simplicity measure") and $F : M \to M$ (the "production relationship"), we say that $\mathcal{P} \in M$ is a* **pattern** *in $X \in M$ to the degree*

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$$\iota_X^{\mathcal{P}} = \left(\left(1 - \frac{d(F(\mathcal{P}), X)}{c(X)} \right) \frac{c(X) - c(\mathcal{P})}{c(X)} \right)^+$$

This degree is called the **pattern intensity** of $\mathcal{P}$ in X. It quantifies the extent to which $\mathcal{P}$ is a pattern in X. Supposing that $F(\mathcal{P}) = X$, then the first factor in the definition equals 1, and we are left with only the second term, which measures the degree of compression obtained via representing X as the result of P rather than simply representing X directly. The greater the compression ratio obtained via using P to represent X, the greater the intensity of P as a pattern in X. The first time, in the case $F(\mathcal{P}) \neq X$, adjusts the pattern intensity downwards to account for the amount of error with which $F(\mathcal{P})$ approximates $\neq X$. If one holds the second factor fixed and thinks about varying the first factor, then: The greater the error, the lossier the compression, and the lower the pattern intensity.

For instance, if one wishes one may take c to denote algorithmic information measured on some reference Turing machine, and $F(X)$ to denote what appears on the second tape of a two-tape Turing machine t time-steps after placing X on its first tape. Other more naturalistic computational models are also possible here and are discussed extensively in Appendix 1 of [Goe06a].

Definition 2 *The* **structure** *of $X \in M$ is the fuzzy set St_X defined via the membership function*

$$\chi_{St_X}(\mathcal{P}) = \iota_X^{\mathcal{P}}$$

This lets us formalize our definition of "mind" alluded to above: the mind of X as the set of patterns associated with X. We can formalize this, for instance, by considering $\mathcal{P}$ to belong to the mind of X if it is a pattern in some Y that includes X. There are then two numbers to look at: $\iota_X^{\mathcal{P}}$ and $P(Y|X)$ (the percentage of Y that is also contained in X). To define the degree to which $\mathcal{P}$ belongs to the mind of X we can then combine these two numbers using some function f that is monotone increasing in both arguments. This highlights the somewhat arbitrary semantics of "of" in the phrase "the mind of X." Which of the patterns binding X to its environment are part of X's mind, and which are part of the world? This isn't necessarily a good question, and the answer seems to depend on what perspective you choose, represented formally in the present framework by what combination function f you choose (for instance if $f(a, b) = a^r b^{2-r}$ then it depends on the choice of $0 < r < 1$).

Next, we can formalize the notion of a "pattern space" by positing a metric on patterns, thus making pattern space a metric space, which will come in handy in some places in later chapters:

Definition 3 *Assuming M is a countable space, the* **structural distance** *is a metric d_{St} defined on M via*

$$d_{St}(X, Y) = T(\chi_{St_X}, \chi_{St_Y})$$

where T is the Tanimoto distance.

The Tanimoto distance between two real vectors A and B is defined as

$$T(A, B) = \frac{A \cdot B}{\|A\|^2 + \|B\|^2 - A \cdot B}$$

and since M is countable this can be applied to fuzzy sets such as St_X via considering the latter as vectors. (As an aside, this can be generalized to uncountable M as well, but we will not require this here.)

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Using this definition of pattern, combined with the formal theory of intelligence given in Chapter 7, one may formalize the various hypotheses made in the previous section, regarding the emergence of different kinds of networks and structures as patterns in intelligent systems. However, it appears quite difficult to prove the formal versions of these hypotheses given current mathematical tools, which renders such formalizations of limited use.

Finally, consider the case where the metric space M has a partial ordering $<$ on it; we may then define

Definition 3.1. $\mathcal{R} \in M$ is a **subpattern** in $X \in M$ to the degree

$$\kappa_X^{\mathcal{R}} = \frac{\int_{\mathcal{P} \in M} \text{true}(R < P) d\mu_X^{\mathcal{P}}}{\int_{\mathcal{P} \in M} d\mu_X^{\mathcal{P}}}$$

This degree is called the **subpattern intensity** of $\mathcal{P}$ in X.

Roughly speaking, the subpattern intensity measures the percentage of patterns in X that contain R (where "containment" is judged by the partial ordering $<$). But the percentage is measured using a weighted average, where each pattern is weighted by its intensity as a pattern in X. A subpattern may or may not be a pattern on its own. A nonpattern that happens to occur within many patterns may be an intense subpattern.

Whether the subpatterns in X are to be considered part of the "mind" of X is a somewhat superfluous question of semantics. Here we choose to extend the definition of mind given in [Goe06a] to include subpatterns as well as patterns, because this makes it simpler to describe the relationship between hypersets and minds, as we will do in Appendix **??**.

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Chapter 4
Brief Survey of Cognitive Architectures

4.1 Introduction

While we believe CogPrime is the most thorough attempt at an architecture for advanced AGI, to date, we certainly recognize there have been many valuable attempts in the past with similar aims; and we also have great respect for other AGI efforts occurring in parallel with CogPrime development, based on alternative, sometimes overlapping, theoretical presuppositions and practical choices. In most of this book we will ignore these other current and historical efforts except where they are directly useful for CogPrime – there are many literature reviews already published, and this is a research treatise not a textbook. In this chapter, however, we will break from this pattern and give a rough high-level overview of the various AGI architectures at play in the field today. The overview definitely has a bias toward other work with some direct relevance to CogPrime, but not an overwhelming bias; we also discuss a number of approaches that are unrelated to, and even in some cases conceptually orthogonal to, our own.

CogPrime builds on prior AI efforts in a variety of ways. Most of the specific algorithms and structures in CogPrime have their roots in prior AI work; and in addition, the CogPrime cognitive architecture has been heavily inspired by some other holistic cognitive architectures, especially (but not exclusively) MicroPsi [Bac09], LIDA [BF09] and DeSTIN [ARK09a, ARC09]. In this chapter we will briefly review some existing cognitive architectures, with especial but not exclusive emphasis on the latter three.

We will articulate some rough mappings between elements of these other architectures and elements of CogPrime – some in this chapter, and some in Chapter 5. However, these mappings will mostly be left informal and very incompletely specified. The articulation of detailed inter-architecture mappings is an important project, but would be a substantial additional project going well beyond the scope of this book. We will not give a thorough review of the similarities and differences between CogPrime and each of these architectures, but only mention some of the highlights.

The reader desiring a more thorough review of cognitive architectures is referred to Wlodek Duch's review paper from the AGI-08 conference [DOP08]; and also to Alexei Samsonovich's review paper [Sam10], which compares a number of cognitive architectures in terms of a feature checklist, and was created collaboratively with the creators of the architectures.

Duch, in his survey of cognitive architectures [DOP08], divides existing approaches into three paradigms – symbolic, emergentist and hybrid – as broadly indicated in Figure 4.1. Drawing on his survey and updating slightly, we give here some key examples of each, and then explain why

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CogPrime represents a significantly more effective approach to embodied human-like general intelligence. In our treatment of emergentist architectures, we pay particular attention to *developmental robotics* architectures, which share considerably with CogPrime in terms of underlying philosophy, but differ via not integrating a symbolic "language and inference" component such as CogPrime includes.

In brief, we believe that the hybrid approach is the most pragmatic one given the current state of AI technology, but that the emergentist approach gets something fundamentally right, by focusing on the emergence of complex dynamics and structures from the interactions of simple components. So CogPrime is a hybrid architecture which (according to the cognitive synergy principle) binds its components together very tightly dynamically, allowing the emergence of complex dynamics and structures in the integrated system. Most other hybrid architectures are less tightly coupled and hence seem ill-suited to give rise to the needed emergent complexity. The other hybrid architectures that do possess the needed tight coupling, such as MicroPsi [Bac09], strike us as underdeveloped and founded on insufficiently powerful learning algorithms.

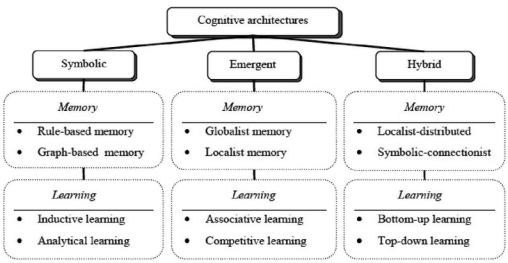

Fig. 4.1: Duch's simplified taxonomy of cognitive architectures. CogPrime falls into the "hybrid" category, but differs from other hybrid architectures in its focus on synergetic interactions between components and their potential to give rise to appropriate system-wide emergent structures enabling general intelligence.

4.2 Symbolic Cognitive Architectures

A venerable tradition in AI focuses on the physical symbol system hypothesis [New90], which states that minds exist mainly to manipulate symbols that represent aspects of the world or themselves. A physical symbol system has the ability to input, output, store and alter symbolic entities, and to execute appropriate actions in order to reach its goals. Generally, symbolic cognitive architectures focus on "working memory" that draws on long-term memory as needed, and utilize a centralized control over perception, cognition and action. Although in principle such architectures could be arbitrarily capable (since symbolic systems have universal repre-

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sentational and computational power, in theory), in practice symbolic architectures tend to be weak in learning, creativity, procedure learning, and episodic and associative memory. Decades of work in this tradition have not resolved these issues, which has led many researchers to explore other options. A few of the more important symbolic cognitive architectures are:

- **SOAR** [LRN87], a classic example of expert rule-based cognitive architecture designed to model general intelligence. It has recently been extended to handle sensorimotor functions, though in a somewhat cognitively unnatural way; and is not yet strong in areas such as episodic memory, creativity, handling uncertain knowledge, and reinforcement learning.
- **ACT-R** [AL03] is fundamentally a symbolic system, but Duch classifies it as a hybrid system because it incorporates connectionist-style activation spreading in a significant role; and there is an experimental thoroughly connectionist implementation to complement the primary mainly-symbolic implementation. Its combination of SOAR-style "production rules" with large-scale connectionist dynamics allows it to simulate a variety of human psychological phenomena, but abstract reasoning, creativity and transfer learning are still missing.
- **EPIC** [RCK01], a cognitive architecture aimed at capturing human perceptual, cognitive and motor activities through several interconnected processors working in parallel. The system is controlled by production rules for cognitive processors and a set of perceptual (visual, auditory, tactile) and motor processors operating on symbolically coded features rather than raw sensory data. It has been connected to SOAR for problem solving, planning and learning,
- **ICARUS** [Lan05], an integrated cognitive architecture for physical agents, with knowledge specified in the form of reactive skills, each denoting goal-relevant reactions to a class of problems. The architecture includes a number of modules: a perceptual system, a planning system, an execution system, and several memory systems. Concurrent processing is absent, attention allocation is fairly crude, and uncertain knowledge is not thoroughly handled.
- **SNePS** (Semantic Network Processing System) [SE07] is a logic, frame and network-based knowledge representation, reasoning, and acting system that has undergone over three decades of development. While it has been used for some interesting prototype experiments in language processing and virtual agent control, it has not yet been used for any large-scale or real-world application.
- **Cyc** [LG90] is an AGI architecture based on predicate logic as a knowledge representation, and using logical reasoning techniques to answer questions and derive new knowledge from old. It has been connected to a natural language engine, and designs have been created for the connection of Cyc with Albus's 4D-RCS [AM01]. Cyc's most unique aspect is the large database of commonsense knowledge that Cycorp has accumulated (millions of pieces of knowledge, entered by specially trained humans in predicate logic format); part of the philosophy underlying Cyc is that once a sufficient quantity of knowledge is accumulated in the knowledge base, the problem of creating human-level general intelligence will become much less difficult due to the ability to leverage this knowledge.

While these architectures contain many valuable ideas and have yielded some interesting results, we feel they are incapable *on their own* of giving rise to the emergent structures and dynamics required to yield humanlike general intelligence using feasible computational resources. However, we are more sanguine about the possibility of ideas and components from symbolic architectures playing a role in human-level AGI via incorporation in hybrid architectures.

We now review a few symbolic architectures in slightly more detail.

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4.2.1 SOAR

The cognitive architectures best known among AI academics are probably Soar and ACT-R, both of which are explicitly being developed with the dual goals of creating human-level AGI and modeling all aspects of human psychology. Neither the Soar nor ACT-R communities feel themselves particularly near these long-term goals, yet they do take them seriously.

Soar is based on IF-THEN rules, otherwise known as "production rules." On the surface this makes it similar to old-style expert systems, but Soar is much more than an expert system; it's at minimum a sophisticated problem-solving engine. Soar explicitly conceives problem solving as a search through solution space for a "goal state" representing a (precise or approximate) problem solution. It uses a methodology of incremental search, where each step is supposed to move the system a little closer to its problem-solving goal, and each step involves a potentially complex "decision cycle."

In the simplest case, the decision cycle has two phases:

- Gathering appropriate information from the system's long-term memory (LTM) into its working memory (WM)
- A decision procedure that uses the gathered information to decide an action

If the knowledge available in LTM isn't enough to solve the problem, then the decision procedure invokes search heuristics like hill-climbing, which try to create new knowledge (new production rules) that will help move the system closer to a solution. If a solution is found by chaining together multiple production rules, then a chunking mechanism is used to combine these rules together into a single rule for future use. One could view the chunking mechanism as a way of converting explicit knowledge into implicit knowledge, similar to "map formation" in CogPrime (see Chapter 42 of Part 2), but in the current Soar design and implementation it is a fairly crude mechanism.

In recent years Soar has acquired a number of additional methods and modalities, including some visual reasoning methods and some mechanisms for handling episodic and procedural knowledge. These expand the scope of the system but the basic production rule and chunking mechanisms as briefly described above remain the core "cognitive algorithm" of the system.

From a CogPrime perspective, what Soar offers is certainly valuable, e.g.

- heuristics for transferring knowledge from LTM into WM
- chaining and chunking of implications
- methods for interfacing between other forms of knowledge and implications

However, a very short and very partial list of the major differences between Soar and CogPrime would include

- CogPrime contains a variety of other core cognitive mechanisms beyond the management and chunking of implications
- the variety of "chunking" type methods in CogPrime goes far beyond the sort of localized chunking done in Soar
- CogPrime is committed to representing uncertainty at the base level whereas Soar's production rules are crisp
- The mechanisms for LTM-WM interaction are rather different in CogPrime, being based on complex nonlinear dynamics as represented in Economic Attention Allocation (ECAN)
- Currently Soar does not contain creativity-focused heuristics like blending or evolutionary learning in its core cognitive dynamic.

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4.2.2 ACT-R

In the grand scope of cognitive architectures, ACT-R is quite similar to Soar, but there are many micro-level differences. ACT-R is defined in terms of declarative and procedural knowledge, where procedural knowledge takes the form of Soar-like production rules, and declarative knowledge takes the form of chunks. It contains a variety of mechanisms for learning new rules and chunks from old; and also contains sophisticated probabilistic equations for updating the activation levels associated with items of knowledge (these equations being roughly analogous in function to, though quite different from, the ECAN equations in CogPrime).

Figure 4.2 displays the current architecture of ACT-R. The flow of cognition in the system is in response to the current goal, currently active information from declarative memory, information attended to in perceptual modules (vision and audition are implemented), and the current state of motor modules (hand and speech are implemented). The early work with ACT-R was based on comparing system performance to human behavior, using only behavioral measures, such as the timing of keystrokes or patterns of eye movements. Using such measures, it was not possible to test detailed assumptions about which modules were active in the performance of a task. More recently the ACT-R community has been engaged in a process of using imaging data to provide converging data on module activity. Figure 4.3 illustrates the associations they have made between the modules in Figure 4.2 and brain regions. Coordination among all of these components occurs through actions of the procedural module, which is mapped to the basal ganglia.

Fig. 4.2: High-level architecture of ACT-R

In practice ACT-R, even more so than Soar, seems to be used more as a programming framework for cognitive modeling than as an AI system. One can fairly easily use ACT-R to program models of specific human mental behaviors, which may then be matched against

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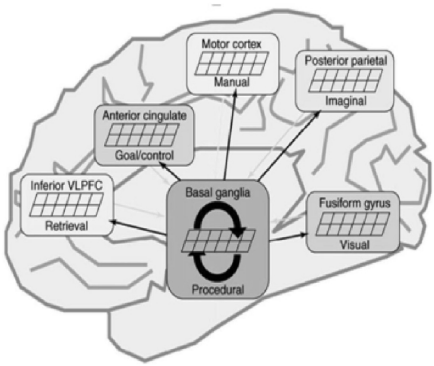

Fig. 4.3: Conjectured Mapping Between ACT-R and the Brain

psychological data. Opinions differ as to whether this sort of modeling is valuable for achieving AGI goals. CogPrime is not designed to support this kind of modeling, as it intentionally does many things very differently from humans.

ACT-R in its original form did not say much about perceptual and motor operations, but recent versions have incorporated EPIC, an independent cognitive architecture focused on modeling these aspects of human behavior.

4.2.3 Cyc and Texai

Our review of cognitive architectures would be incomplete without mentioning Cyc [LG90], one of the best known and best funded AGI-oriented projects in history. While the main focus of the Cyc project has been on the hand-coding of large amounts of declarative knowledge, there is also a cognitive architecture of sorts there. The center of Cyc is an engine for logical deduction, acting on knowledge represented in predicate logic. A natural language engine has been associated with the logic engine, which enables one to ask English questions and get English replies.

Stephen Reed, while an engineer at Cycorp, designed a perceptual-motor front end for Cyc based on James Albus' Reference Model Architecture; the ensuing system, called Cognitive-Cyc, would have been the first full-fledged cognitive architecture based on Cyc, but was not implemented. Reed left Cycorp and is now building a system called Texai, which has many similarities to Cyc (and relies upon the OpenCyc knowledge base, a subset of Cyc's overall knowledge base), but incorporates a CognitiveCyc style cognitive architecture.

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4.2.4 NARS

Pei Wang's NARS logic [Wan06] played a large role in the development of PLN, CogPrime's uncertain logic component, a relationship that is discussed in depth in [GMIH08] and won't be re-emphasized here. However, NARS is more than just an uncertain logic, it is also an overall cognitive architecture (which is centered on NARS logic, but also includes other aspects). CogPrime bears little relation to NARS except in the specific similarities between PLN logic and NARS logic, but, the other aspects of NARS are worth briefly recounting here.

NARS is formulated as a system for processing tasks, where a task consists of a question or a piece of new knowledge. The architecture is focused on declarative knowledge, but some pieces of knowledge may be associated with executable procedures, which allows NARS to carry out control activities (in roughly the same way that a Prolog program can).

At any given time a NARS system contains

- working memory: a small set of tasks which are active, kept for a short time, and closely related to new questions and new knowledge
- long-term memory: a huge set of knowledge which is passive, kept for a long time, and not necessarily related to current questions and knowledge

The working and long term memory spaces of NARS may each be thought of as a set of chunks, where each chunk consists of a set of tasks and a set of knowledge. NARS's basic cognitive process is:

1. choose a chunk
2. choose a task from that chunk
3. choose a piece of knowledge from that chunk
4. use the task and knowledge to do inference
5. send the new tasks to corresponding chunks

Depending on the nature of the task and knowledge, the inference involved may be one of the following:

- if the task is a question, and the knowledge happens to be an answer to the question, a copy of the knowledge is generated as a new task
- backward inference
- revision (merging two pieces of knowledge with the same form but different truth value)
- forward inference
- execution of a procedure associated with a piece of knowledge

Unlike many other systems, NARS doesn't decide what type of inference is used to process a task when the task is accepted, but works in a data-driven way – that is, it is the task and knowledge that dynamically determine what type of inference will be carried out

The "choice" processes mentioned above are done via assigning relative priorities to

- chunks (where they are called activity)
- tasks (where they are called urgency)
- knowledge (where they are called importance)

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and then distributing the system's resources accordingly, based on a probabilistic algorithm. (It's interesting to note that while NARS uses probability theory as part of its control mechanism, the logic it uses to represent its own knowledge about the world is nonprobabilistic. This is considered conceptually consistent, in the context of NARS theory, because system control is viewed as a domain where the system's knowledge is more complete, thus more amenable to probabilistic reasoning.)

4.2.5 GLAIR and SNePS

Another logic-focused cognitive architecture, very different from NARS in detail, is Stuart Shapiro's GLAIR cognitive architecture, which is centered on the SNePS paraconsistent logic [SE07].

Like NARS, the core "cognitive loop" of GLAIR is based on reasoning: either thinking about some percept (e.g. linguistic input, or sense data from the virtual or physical world), or answering some question. This inference based cognition process is turned into an intelligent agent control process via coupling it with an acting component, which operates according to a set of policies, each one of which tells the system when to take certain internal or external actions (including internal reasoning actions) in response to its observed internal and external situation.

GLAIR contains multiple layers:

- the Knowledge Layer (KL), which contains the beliefs of the agent, and is where reasoning, planning, and act selection are performed
- the Sensori-Actuator Layer (SAL), contains the controllers of the sensors and effectors of the hardware or software robot.
- the Perceptuo-Motor Layer (PML), which grounds the KL symbols in perceptual structures and subconscious actions, contains various registers for providing the agent's sense of situatedness in the environment, and handles translation and communication between the KL and the SAL.

The logical Knowledge Layer incorporates multiple memory types using a common representation (including declarative, procedural, episodic, attentional and intentional knowledge, and meta-knowledge). To support this broad range of knowledge types, a broad range of logical inference mechanisms are used, so that the KL may be variously viewed as predicate logic based, frame based, semantic network based, or from other perspectives.

What makes GLAIR more robust than most logic based AI approaches is the novel paraconsistent logical formalism used in the knowledge base, which means (among other things) that uncertain, speculative or erroneous knowledge may exist in the system's memory without leading the system to create a broadly erroneous view of the world or carry out egregiously unintelligent actions. CogPrime is not thoroughly logic-focused like GLAIR is, but in its logical aspect it seeks a similar robustness through its use of PLN logic, which embodies properties related to paraconsistency.

Compared to CogPrime, we see that GLAIR has a similarly integrative approach, but that the integration of different sorts of cognition is done more strictly within the framework of logical knowledge representation.

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4.3 Emergentist Cognitive Architectures

Another species of cognitive architecture expects abstract symbolic processing to emerge from lower-level "subsymbolic" dynamics, which sometimes (but not always) are designed to simulate neural networks or other aspects of human brain function. These architectures are typically strong at recognizing patterns in high-dimensional data, reinforcement learning and associative memory; but no one has yet shown how to achieve high-level functions such as abstract reasoning or complex language processing using a purely subsymbolic approach. A few of the more important subsymbolic, emergentist cognitive architectures are:

- **DeSTIN** [ARK09a, ARC09], which is part of CogPrime, may also be considered as an autonomous AGI architecture, in which case it is emergentist and contains mechanisms to encourage language, high-level reasoning and other abstract aspects of intelligent to emerge from hierarchical pattern recognition and related self-organizing network dynamics. In CogPrime DeSTIN is used as part of a hybrid architecture, which greatly reduces the reliance on DeSTIN's emergent properties.
- **Hierarchical Temporal Memory (HTM)** [HB06] is a hierarchical temporal pattern recognition architecture, presented as both an AI approach and a model of the cortex. So far it has been used exclusively for vision processing and we will discuss its shortcomings later in the context of our treatment of DeSTIN.
- **SAL** [JL08], based on the earlier and related **IBCA** (Integrated Biologically-based Cognitive Architecture) is a large-scale emergent architecture that seeks to model distributed information processing in the brain, especially the posterior and frontal cortex and the hippocampus. So far the architectures in this lineage have been used to simulate various human psychological and psycholinguistic behaviors, but haven't been shown to give rise to higher-level behaviors like reasoning or subgoaling.
- **NOMAD** (Neurally Organized Mobile Adaptive Device) automata and its successors [KE06] are based on Edelman's "Neural Darwinism" model of the brain, and feature large numbers of simulated neurons evolving by natural selection into configurations that carry out sensorimotor and categorization tasks. The emergence of higher-level cognition from this approach seems rather unlikely.
- Ben Kuipers and his colleagues [MK07, MK08, MK09]have pursued an extremely innovative research program which combines qualitative reasoning and reinforcement learning to enable an intelligent agent to learn how to act, perceive and model the world. Kuipers' notion of "bootstrap learning" involves allowing the robot to learn almost *everything* about its world, including for instance the structure of 3D space and other things that humans and other animals obtain via their genetic endowments. Compared to Kuipers' approach, CogPrime falls in line with most other approaches which provide more "hard-wired" structure, following the analogy to biological organisms that are born with more innate biases.

There is also a set of emergentist architectures focused specifically on developmental robotics, which we will review below in a separate subsection, as all of these share certain common characteristics.

Our general perspective on the emergentist approach is that it is philosophically correct but currently pragmatically inadequate. Eventually, *some* emergentist approach could surely succeed at giving rise to humanlike general intelligence – the human brain, after all, is plainly an emergentist system. However, we currently lack understanding of how the brain gives rise to abstract reasoning and complex language, and none of the existing emergentist systems

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seem remotely capable of giving rise to such phenomena. It seems to us that the creation of a successful emergentist AGI will have to wait for either a detailed understanding of how the brain gives rise to abstract thought, or a much more thorough mathematical understanding of the dynamics of complex self-organizing systems.

The concept of cognitive synergy is more relevant to emergentist than to symbolic architectures. In a complex emergentist architecture with multiple specialized components, much of the emergence is expected to arise via synergy between different richly interacting components. Symbolic systems, at least in the forms currently seen in the literature, seem less likely to give rise to cognitive synergy as their dynamics tend to be simpler. And hybrid systems, as we shall see, are somewhat diverse in this regard: some rely heavily on cognitive synergies and others consist of more loosely coupled components.

We now review the DeSTIN emergentist architecture in more detail, and then turn to the developmental robotics architectures.

4.3.1 DeSTIN: A Deep Reinforcement Learning Approach to AGI

The DeSTIN architecture, created by Itamar Arel and his colleagues, addresses the problem of general intelligence using hierarchical spatiotemporal networks designed to enable scalable perception, state inference and reinforcement-learning-guided action in real-world environments. DeSTIN has been developed with the plan of gradually extending it into a complete system for humanoid robot control, founded on the same qualitative information-processing principles as the human brain (though without striving for detailed biological realism). However, the practical work with DeSTIN to date has focused on visual and auditory processing; and in the context of the present proposal, the intention is to utilize DeSTIN for perception and actuation oriented processing, hybridizing it with CogPrime which will handle abstract cognition and language. Here we will discuss DeSTIN primarily in the perception context, only briefly mentioning the application to actuation which is conceptually similar.

In DeSTIN (see Figure 4.4), perception is carried out by a deep spatiotemporal inference network, which is connected to a similarly architected critic network that provides feedback on the inference network's performance, and an action network that controls actuators based on the activity in the inference network (Figure 4.5 depicts a standard action hierarchy, of which the hierarchy in DeSTIN is an example). The nodes in these networks perform probabilistic pattern recognition according to algorithms to be described below; and the nodes in each of the networks may receive states of nodes in the other networks as inputs, providing rich interconnectivity and synergetic dynamics.

4.3.1.1 Deep versus Shallow Learning for Perceptual Data Processing

The most critical feature of DeSTIN is its uniquely robust approach to modeling the world based on perceptual data. Mimicking the efficiency and robustness by which the human brain analyzes and represents information has been a core challenge in AI research for decades. For instance, humans are exposed to massive amounts of visual and auditory data every second of every day, and are somehow able to capture critical aspects of it in a way that allows for appropriate future recollection and action selection. For decades, it has been known that the

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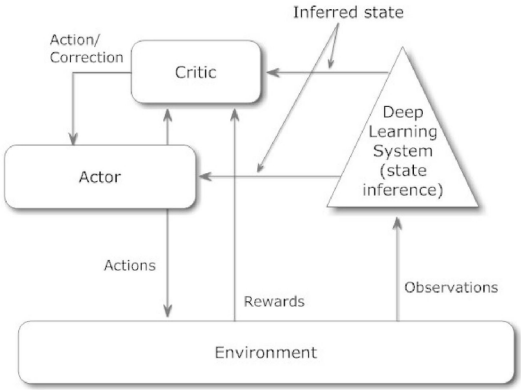

Fig. 4.4: High-level architecture of DeSTIN

brain is a massively parallel fabric, in which computation processes and memory storage are highly distributed. But massive parallelism is not in itself a solution – one also needs the right architecture; which DeSTIN provides, building on prior work in the area of deep learning.

Humanlike intelligence is heavily adapted to the physical environments in which humans evolved; and one key aspect of sensory data coming from our physical environments is its **hierarchical** structure. However, most machine learning and pattern recognition systems are "shallow" in structure, not explicitly incorporating the hierarchical structure of the world in their architecture. In the context of perceptual data processing, the practical result of this is the need to couple each shallow learner with a pre-processing stage, wherein high-dimensional sensory signals are reduced to a lower-dimension feature space that can be understood by the shallow learner. The hierarchical structure of the world is thus crudely captured in the hierarchy of "preprocessor plus shallow learner." In this sort of approach, much of the intelligence of the system shifts to the feature extraction process, which is often imperfect and always application-domain specific.

Deep machine learning has emerged as a more promising framework for dealing with complex, high-dimensional real-world data. Deep learning systems possess a hierarchical structure that intrinsically biases them to recognize the hierarchical patterns present in real-world data. Thus, they hierarchically form a feature space that is driven by regularities in the observations, rather than by hand-crafted techniques. They also offer robustness to many of the distortions and transformations that characterize real-world signals, such as noise, displacement, scaling, etc.

Deep belief networks [HOT06] and Convolutional Neural Networks [LBDE90] have been demonstrated to successfully address pattern inference in high dimensional data (e.g. images). They owe their success to their underlying paradigm of partitioning large data structures into smaller, more manageable units, and discovering the dependencies that may or may not exist

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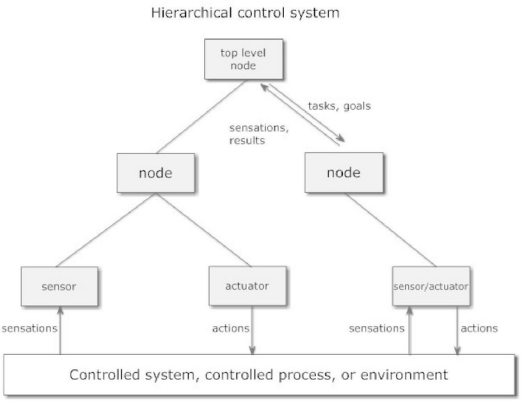

Fig. 4.5: A standard, general-purpose hierarchical control architecture. DeSTIN's control hierarchy exemplifies this architecture, with the difference lying mainly in the DeSTIN control hierarchy's tight integration with the state inference (perception) and critic (reinforcement) hierarchies.

between such units. However, this paradigm has its limitations; for instance, these approaches do not represent temporal information with the same ease as spatial structure. Moreover, some key constraints are imposed on the learning schemes driving these architectures, namely the need for layer-by-layer training, and oftentimes pre-training. DeSTIN overcomes the limitations of prior deep learning approaches to perception processing, and also extends beyond perception to action and reinforcement learning.

4.3.1.2 DeSTIN for Perception Processing

The hierarchical architecture of DeSTIN's spatiotemporal inference network comprises an arrangement into multiple layers of "nodes" comprising multiple instantiations of an identical cortical circuit. Each node corresponds to a particular spatiotemporal region, and uses a statistical learning algorithm to characterize the sequences of patterns that are presented to it by nodes in the layer beneath it. More specifically,

- At the very lowest layer of the hierarchy nodes receive as input raw data (e.g. pixels of an image) and continuously construct a belief state that attempts to characterize the sequences of patterns viewed.

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- The second layer, and all those above it, receive as input the belief states of nodes at their corresponding lower layers, and attempt to construct belief states that capture regularities in their inputs.
- Each node also receives as input the belief state of the node above it in the hierarchy (which constitutes "contextual" information)

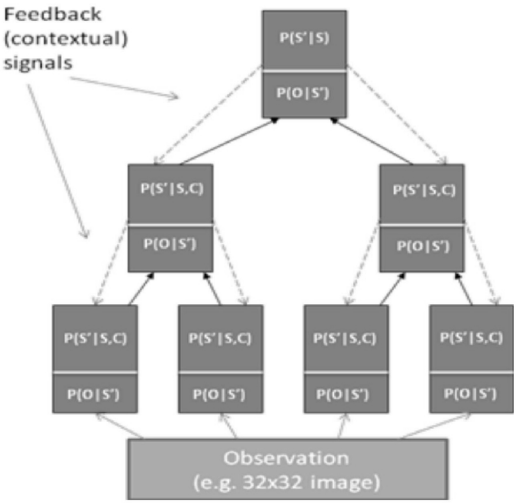

Fig. 4.6: Small-scale instantiation of the DeSTIN perceptual hierarchy. Each box represents a node, which corresponds to a spatiotemporal region (nodes higher in the hierarchy corresponding to larger regions). O denotes the current observation in the region, C is the state of the higher-layer node, and S and S' denote state variables pertaining to two subsequent time steps. In each node, a statistical learning algorithm is used to predict subsequent states based on prior states, current observations, and the state of the higher-layer node.

More specifically, each of the DeSTIN nodes, referring to a specific spacetime region, contains a set of state variables conceived as clusters, each corresponding to a set of previously-observed sequences of events. These clusters are characterized by centroids (and are hence assumed roughly spherical in shape), and each of them comprises a certain "spatiotemporal form" recognized by the system in that region. Each node then contains the task of predicting the likelihood of a certain centroid being most apropos in the near future, based on the past history of observations in the node. This prediction may be done by simple probability tabulation, or via

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application of supervised learning algorithms such as recurrent neural networks. These clustering and prediction processes occur separately in each node, but the nodes are linked together via bidirectional dynamics: each node feeds input to its parents, and receives "advice" from its parents that is used to condition its probability calculations in a contextual way.

These processes are executed formally by the following basic belief update rule, which governs the learning process and is identical for every node in the architecture. The belief state is a probability mass function over the sequences of stimuli that the nodes learns to represent. Consequently, each node is allocated a predefined number of state variables each denoting a dynamic pattern, or sequence, that is autonomously learned. The DeSTIN update rule maps the current observation (o), belief state (b), and the belief state of a higher-layer node or context (c), to a new (updated) belief state (b'), such that

$$b'(s') = \Pr(s'|o,b,c) = \frac{\Pr(s' \cap o \cap b \cap c)}{\Pr(o \cap b \cap c)}, \tag{4.1}$$

alternatively expressed as

$$b'(s') = \frac{\Pr(o|s',b,c)\Pr(s'|b,c)\Pr(b,c)}{\Pr(o|b,c)\Pr(b,c)}. \tag{4.2}$$

Under the assumption that observations depend only on the true state, or $\Pr(o|s',b,c) = \Pr(o|s')$, we can further simplify the expression such that

$$b'(s') = \frac{\Pr(o|s')\Pr(s'|b,c)}{\Pr(o|b,c)}, \tag{4.3}$$

where $\Pr(s'|b,c) = \sum_{s \in S} \Pr(s'|s,c)\, b(s)$, yielding the belief update rule

$$b'(s') = \frac{\Pr(o|s') \sum_{s \in S} \Pr(s'|s,c)\, b(s)}{\sum_{s'' \in S} \Pr(o|s'') \sum_{s \in S} \Pr(s''|s,c)\, b(s)}, \tag{4.4}$$

where S denotes the sequence set (i.e. belief dimension) such that the denominator term is a normalization factor.

One interpretation of eq. (4.4) would be that the static pattern similarity metric, $\Pr(o|s')$, is modulated by a construct that reflects the system dynamics, $\Pr(s'|s,c)$. As such, the belief state inherently captures both spatial and temporal information. In our implementation, the belief state of the parent node, c, is chosen using the selection rule

$$c = \arg\max_{s} b_p(s), \tag{4.5}$$

where b_p is the belief distribution of the parent node.

A close look at eq. (4.4) reveals that there are two core constructs to be learned, $\Pr(o|s')$ and $\Pr(s'|s,c)$. In the current DeSTIN design, the former is learned via online clustering while the latter is learned based on experience by inductively learning a rule that predicts the next state s' given the prior state s and c.

The overall result is a robust framework that autonomously (i.e. with no human engineered pre-processing of any type) learns to represent complex data patterns, and thus serves the

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critical role of building and maintaining a model of the state of the world. In a vision processing context, for example, it allows for powerful unsupervised classification. If shown a variety of real-world scenes, it will automatically form internal structures corresponding to the various natural categories of objects shown in the scenes, such as trees, chairs, people, etc.; and also the various natural categories of events it sees, such as reaching, pointing, falling. And, as will be discussed below, it can use feedback from DeSTIN's action and critic networks to further shape its internal world-representation based on reinforcement signals.

Benefits of DeSTIN for Perception Processing

DeSTIN's perceptual network offers multiple key attributes that render it more powerful than other deep machine learning approaches to sensory data processing:

1. The belief space that is formed across the layers of the perceptual network inherently captures both *spatial and temporal regularities* in the data. Given that many applications require that temporal information be discovered for robust inference, this is a key advantage over existing schemes.
2. Spatiotemporal regularities in the observations are captured in a coherent manner (rather than being represented via two separate mechanisms)
3. All processing is both top-down and bottom-up, and both hierarchical and heterarchical, based on nonlinear feedback connections directing activity and modulating learning in multiple directions through DeSTIN's cortical circuits
4. Support for multi-modal fusing is intrinsic within the framework, yielding a powerful state inference system for real-world, partially-observable settings.
5. Each node is identical, which makes it easy to map the design to massively parallel platforms, such as graphics processing units.

Points 2-4 in the above list describe how DeSTIN's perceptual network displays its own "cognitive synergy" in a way that fits naturally into the overall synergetic dynamics of the overall CogPrime architecture. Using this cognitive synergy, DeSTIN's perceptual network addresses a key aspect of general intelligence: the ability to robustly infer the state of the world, with which the system interacts, in an accurate and timely manner.

4.3.1.3 DeSTIN for Action and Control

DeSTIN's perceptual network performs unsupervised world-modeling, which is a critical aspect of intelligence but of course is not the whole story. DeSTIN's action network, coupled with the perceptual network, orchestrates actuator commands into complex movements, but also carries out other functions that are more cognitive in nature.

For instance, people learn to distinguish between cups and bowls in part via hearing other people describe some objects as cups and others as bowls. To emulate this kind of learning, DeSTIN's critic network provides positive or negative reinforcement signals based on whether the action network has correctly identified a given object as a cup or a bowl, and this signal then impacts the nodes in the action network. The critic network takes a simple external "degree of success or failure" signal and turns it into multiple reinforcement signals to be fed into the multiple layers of the action network. The result is that the action network self-organizes so

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as to include an implicit "cup versus bowl" classifier, whose inputs are the outputs of some of the nodes in the higher levels of the perceptual network. This classifier belongs in the action network because it is part of the procedure by which the DeSTIN system carries out the action of identifying an object as a cup or a bowl.

This example illustrates how the learning of complex concepts and procedures is divided fluidly between the perceptual network, which builds a model of the world in an unsupervised way, and the action network, which learns how to respond to the world in a manner that will receive positive reinforcement from the critic network.

4.3.2 Developmental Robotics Architectures

A particular subset of emergentist cognitive architectures are sufficiently important that we consider them separately here: these are *developmental robotics* architectures, focused on controlling robots without significant "hard-wiring" of knowledge or capabilities, allowing robots to learn (and learn how to learn, etc.) via their engagement with the world. A significant focus is often placed here on "intrinsic motivation," wherein the robot explores the world guided by internal goals like novelty or curiosity, forming a model of the world as it goes along, based on the modeling requirements implied by its goals. Many of the foundations of this research area were laid by Juergen Schmidhuber's work in the 1990s [Sch91b, Sch91a, Sch95, Sch02], but now with more powerful computers and robots the area is leading to more impressive practical demonstrations.

We mention here a handful of the important initiatives in this area:

- Juyang Weng's **Dav** [HZT+02] and **SAIL** [WHZ+00] projects involve mobile robots that explore their environments autonomously, and learn to carry out simple tasks by building up their own world-representations through both unsupervised and teacher-driven processing of high-dimensional sensorimotor data. The underlying philosophy is based on human child development [WH06], the knowledge representations involved are neural network based, and a number of novel learning algorithms are involved, especially in the area of vision processing.
- **FLOWERS** [BO09], an initiative at the French research institute INRIA, led by Pierre-Yves Oudeyer, is also based on a principle of trying to reconstruct the processes of development of the human child's mind, spontaneously driven by intrinsic motivations. Kaplan [Kap08] has taken this project in a direction closely related to our own via the creation of a "robot playroom." Experiential language learning has also been a focus of the project [OK06], driven by innovations in speech understanding.
- **IM-CLEVER**[1], a new European project coordinated by Gianluca Baldassarre and conducted by a large team of researchers at different institutions, is focused on creating software enabling an iCub [MSV+08] humanoid robot to explore the environment and learn to carry out human childlike behaviors based on its own intrinsic motivations. As this project is the closest to our own we will discuss it in more depth below.

Like CogPrime, IM-CLEVER is a humanoid robot intelligence architecture guided by intrinsic motivations, and using hierarchical architectures for reinforcement learning and sensory ab-

[1] `http://im-clever.noze.it/project/project-description`

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straction. IM-CLEVER's motivational structure is based in part on Schmidhuber's information-theoretic model of curiosity [Sch06]; and CogPrime's Psi-based motivational structure utilizes probabilistic measures of novelty, which are mathematically related to Schmidhuber's measures. On the other hand, IM-CLEVER's use of reinforcement learning follows Schmidhuber's earlier work RL for cognitive robotics [BS04, BZGS06], Barto's work on intrinsically motivated reinforcement learning [SB06, SM05], and Lee's [LMC07b, LMC07a] work on developmental reinforcement learning; whereas CogPrime's assemblage of learning algorithms is more diverse, including probabilistic logic, concept blending and other symbolic methods (in the OCP component) as well as more conventional reinforcement learning methods (in the DeSTIN component).

In many respects IM-CLEVER bears a moderately strong resemblance to DeSTIN, whose integration with CogPrime is discussed in Chapter 26 of Part 2 (although IM-CLEVER has much more focus on biological realism than DeSTIN). Apart from numerous technical differences, the really big distinction between IM-CLEVER and CogPrime is that in the latter we are proposing to hybridize a hierarchical-abstraction/reinforcement-learning system (such as DeSTIN) with a more abstract symbolic cognition engine that explicitly handles probabilistic logic and language. IM-CLEVER lacks the aspect of hybridization with a symbolic system, taking more of a pure emergentist strategy. Like DeSTIN considered as a standalone architecture IM-CLEVER does entail a high degree of cognitive synergy, between components dealing with perception, world-modeling, action and motivation. However, the "emergentist versus hybrid" is a large qualitative difference between the two approaches.

In all, while we largely agree with the philosophy underlying developmental robotics, our intuition is that the learning and representational mechanisms underlying the current systems in this area are probably not powerful enough to lead to human child level intelligence. We expect that these systems will develop interesting behaviors but fall short of robust preschool level competency, especially in areas like language and reasoning where symbolic systems have typically proved more effective. This intuition is what impels us to pursue a hybrid approach, such as CogPrime. But we do feel that eventually, once the mechanisms underlying brains are better understood and robotic bodies are richer in sensation and more adept in actuation, some sort of emergentist, developmental-robotics approach can be successful at creating humanlike, human-level AGI.

4.4 Hybrid Cognitive Architectures

In response to the complementary strengths and weaknesses of the symbolic and emergentist approaches, in recent years a number of researchers have turned to integrative, hybrid architectures, which combine subsystems operating according to the two different paradigms. The combination may be done in many different ways, e.g. connection of a large symbolic subsystem with a large subsymbolic system, or the creation of a population of small agents each of which is both symbolic and subsymbolic in nature.

Nils Nilsson expressed the motivation for hybrid AGI systems very clearly in his article at the AI-50 conference (which celebrated the 50'th anniversary of the AI field) [Nil09]. While affirming the value of the Physical Symbol System Hypothesis that underlies symbolic AI, he argues that "the PSSH explicitly assumes that, whenever necessary, symbols will be grounded in objects in the environment through the perceptual and effector capabilities of a physical symbol system." Thus, he continues,

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"I grant the need for non-symbolic processes in some intelligent systems, but I think they supplement rather than replace symbol systems. I know of no examples of reasoning, understanding language, or generating complex plans that are best understood as being performed by systems using exclusively non-symbolic processes....

AI systems that achieve human-level intelligence will involve a combination of symbolic and non-symbolic processing."

A few of the more important hybrid cognitive architectures are:

- **CLARION** [SZ04] is a hybrid architecture that combines a symbolic component for reasoning on "explicit knowledge" with a connectionist component for managing "implicit knowledge." Learning of implicit knowledge may be done via neural net, reinforcement learning, or other methods. The integration of symbolic and subsymbolic methods is powerful, but a great deal is still missing such as episodic knowledge and learning and creativity. Learning in the symbolic and subsymbolic portions is carried out separately rather than dynamically coupled, minimizing "cognitive synergy" effects.
- **DUAL** [NK04] is the most impressive system to come out of Marvin Minsky's "Society of Mind" paradigm. It features a population of agents, each of which combines symbolic and connectionist representation, self-organizing to collectively carry out tasks such as perception, analogy and associative memory. The approach seems innovative and promising, but it is unclear how the approach will scale to high-dimensional data or complex reasoning problems due to the lack of a more structured high-level cognitive architecture.
- **LIDA** [BF09] is a comprehensive cognitive architecture heavily based on Bernard Baars' "Global Workspace Theory". It articulates a "cognitive cycle" integrating various forms of memory and intelligent processing in a single processing loop. The architecture ties in well with both neuroscience and cognitive psychology, but it deals most thoroughly with "lower level" aspects of intelligence, handling more advanced aspects like language and reasoning only somewhat sketchily. There is a clear mapping between LIDA structures and processes and corresponding structures and processing in OCP; so that it's only a mild stretch to view CogPrime as an instantiation of the general LIDA approach that extends further both in the lower level (to enable robot action and sensation via DeSTIN) and the higher level (to enable advanced language and reasoning via OCP mechanisms that have no direct LIDA analogues).
- **MicroPsi** [Bac09] is an integrative architecture based on Dietrich Dorner's Psi model of motivation, emotion and intelligence. It has been tested on some practical control applications, and also on simulating artificial agents in a simple virtual world. MicroPsi's comprehensiveness and basis in neuroscience and psychology are impressive, but in the current version of MicroPsi, learning and reasoning are carried out by algorithms that seem unlikely to scale. OCP incorporates the Psi model for motivation and emotion, so that MicroPsi and CogPrime may be considered very closely related systems. But similar to LIDA, MicroPsi currently focuses on the "lower level" aspects of intelligence, not yet directly handling advanced processes like language and abstract reasoning.
- **PolyScheme** [Cas07] integrates multiple methods of representation, reasoning and inference schemes for general problem solving. Each Polyscheme "specialist" models a different aspect of the world using specific representation and inference techniques, interacting with other specialists and learning from them. Polyscheme has been used to model infant reasoning including object identity, events, causality, and spatial relations. The integration of

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reasoning methods is powerful, but the overall cognitive architecture is simplistic compared to other systems and seems focused more on problem-solving than on the broader problem of intelligent agent control.

- **Shruti** [SA93] is a fascinating biologically-inspired model of human reflexive inference, which represents in connectionist architecture relations, types, entities and causal rules using focal-clusters. However, much like Hofstadter's earlier Copycat architecture [Hof95], Shruti seems more interesting as a prototype exploration of ideas than as a practical AGI system; at least, after a significant time of development it has not proved significantly effective in any applications
- James Albus's **4D/RCS** robotics architecture shares a great deal with some of the emergentist architectures discussed above, e.g. it has the same hierarchical pattern recognition structure as DeSTIN and HTM, and the same three cross-connected hierarchies as DeSTIN, and shares with the developmental robotics architectures a focus on real-time adaptation to the structure of the world. However, 4D/RCS is not foundationally learning-based but relies on hard-wired architecture and algorithms, intended to mimic the qualitative structure of relevant parts of the brain (and intended to be *augmented* by learning, which differentiates it from emergentist approaches.

As our own CogPrime approach is a hybrid architecture, it will come as no surprise that we believe several of the existing hybrid architectures are fundamentally going in the right direction. However, nearly all the existing hybrid architectures have severe shortcomings which we feel will prevent them from achieving robust humanlike AGI.

Many of the hybrid architectures are in essence "multiple, disparate algorithms carrying out separate functions, encapsulated in black boxes and communicating results with each other." For instance, PolyScheme, ACT-R and CLARION all display this "modularity" property to a significant extent. These architectures lack the rich, real-time interaction between the *internal dynamics* of various memory and learning processes that we believe is critical to achieving humanlike general intelligence using realistic computational resources. On the other hand, those architectures that feature richer integration – such as DUAL, Shruti, LIDA and MicroPsi – have the flaw of relying (at least in their current versions) on overly simplistic learning algorithms, which drastically limits their scalability.

It does seem plausible to us that some of these hybrid architectures could be dramatically extended or modified so as to produce humanlike general intelligence. For instance, one could replace LIDA's learning algorithms with others that interrelate with each other in a nuanced synergetic way; or one could replace MicroPsi's simple learning and reasoning methods with much more powerful and scalable ones acting on the same data structures. However, making these changes would dramatically alter the cognitive architectures in question on multiple levels.

4.4.1 Neural versus Symbolic; Global versus Local

The "symbolic versus emergentist" dichotomy that we have used to structure our review of cognitive architectures is not absolute nor fully precisely defined; it is more of a heuristic distinction. In this section, before plunging into the details of particular hybrid cognitive architectures, we review two other related dichotomies that are useful for understanding hybrid systems: *neural versus symbolic* systems, and *globalist versus localist* knowledge representation.

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4.4.1.1 Neural-Symbolic Integration

The distinction between neural and symbolic systems has gotten fuzzier and fuzzier in recent years, with developments such as

- Logic-based systems being used to control embodied agents (hence using logical terms to deal with data that is apparently perception or actuation-oriented in nature, rather than being symbolic in the semiotic sense), see [SS03a] and [GMIH08].
- Hybrid systems combining neural net and logical parts, or using logical or neural net components interchangeably in the same role [LAon].
- Neural net systems being used for strongly symbolic tasks such as automated grammar learning ([Elm91], [Elm91], plus more recent work.)

Figure 4.7 presents a schematic diagram of a generic neural-symbolic system, generalizing from [BH05], a paper that gives an elegant categorization of neural-symbolic AI systems. Figure 4.8 depicts several broad categories of neural-symbolic architecture.

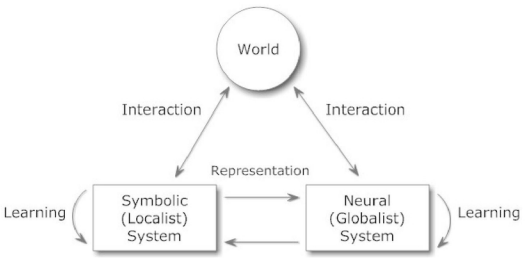

Fig. 4.7: Generic neural-symbolic architecture

Bader and Hitzler categorize neural-symbolic systems according to three orthogonal axes: interrelation, language and usage. "Language" refers to the type of language used in the symbolic component, which may be logical, automata-based, formal grammar-based, etc. "Usage" refers to the purpose to which the neural-symbolic interrelation is put. We tend to use "learning" as an encompassing term for all forms of ongoing knowledge-creation, whereas Bader and Hitzler distinguish learning from reasoning.

Of Bader and Hitzler's three axes the one that interests us most here is "interrelation", which refers to the way the neural and symbolic components of the architecture intersect with each other. They distinguish "hybrid" architectures which contain separate but equal, interacting neural and symbolic components; versus "integrative" architectures in which the symbolic component essentially rides piggyback on the neural component, extracting information from it and helping it carry out its learning, but playing a clearly derived and secondary role. We prefer Sun's (2001) term "monolithic" to Bader and Hitzler's "integrative" to describe this type of system, as the latter term seems best preserved in its broader meaning.

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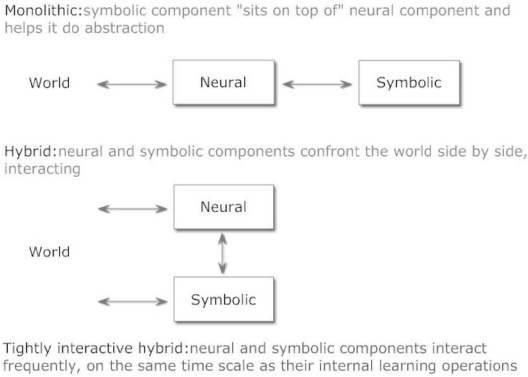

Fig. 4.8: Broad categories of neural-symbolic architecture

Within the scope of hybrid neural-symbolic systems, there is another axis which Bader and Hitzler do not focus on, because the main interest of their review is in monolithic systems. We call this axis "interactivity"', and what we are referring to is the frequency of high-information-content, high-influence interaction between the neural and symbolic components in the hybrid system. In a low-interaction hybrid system, the neural and symbolic components don't exchange large amounts of mutually influential information all that frequently, and basically act like independent system components that do their learning/reasoning/thinking periodically sending each other their conclusions. In some cases, interaction may be asymmetric: one component may frequently send a lot of influential information to the other, but not vice versa. However, our hypothesis is that the most capable neural-symbolic systems are going to be the symmetrically highly interactive ones.

In a symmetric high-interaction hybrid neural-symbolic system, the neural and symbolic components exchange influential information sufficiently frequently that each one plays a major role in the other one's learning/reasoning/thinking processes. Thus, the learning processes of each component must be considered as part of the overall dynamic of the hybrid system. The two components aren't just feeding their outputs to each other as inputs, they're mutually guiding each others' internal processing.

One can make a speculative argument for the relevance of this kind of architecture to neuroscience. It seems plausible that this kind of neural-symbolic system roughly emulates the kind of interaction that exists between the brain's neural subsystems implementing localist symbolic processing, and the brain's neural subsystems implementing globalist, classically "connectionist" processing. It seems most likely that, in the brain, symbolic functionality emerges from an underlying layer of neural dynamics. However, it is also reasonable to conjecture that this symbolic functionality is confined to a functionally distinct subsystem of the brain, which then

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interacts with other subsystems in the brain much in the manner that the symbolic and neural components of a symmetric high-interaction neural-symbolic system interact.

Neuroscience speculations aside, however, our key conjecture regarding neural-symbolic integration is that this sort of neural-symbolic system presents a promising direction for artificial general intelligence research. In Chapter 26 of Volume 2 we will give a more concrete idea of what a symmetric high-interaction hybrid neural-symbolic architecture might look like, exploring the potential for this sort of hybridization between the OpenCogPrime AGI architecture (which is heavily symbolic in nature) and hierarchical attractor neural net based architectures such as DeSTIN.

4.5 Globalist versus Localist Representations

Another interesting distinction, related to but different from "symbolic versus emergentist" and "neural versus symbolic", may be drawn between cognitive systems (or subsystems) where memory is essentially **global**, and those where memory is essentially **local**. In this section we will pursue this distinction in various guises, along with the less familiar notion of **glocal memory**.

This globalist/localist distinction is most easily conceptualized by reference to memories corresponding to categories of entities or events in an external environment. In an AI system that has an internal notion of "activation" – i.e. in which some of its internal elements are more active than others, at any given point in time – one can define the *internal image* of an external event or entity as the fuzzy set of internal elements that tend to be active when that event or entity is presented to the system's sensors. If one has a particular set S of external entities or events of interest, then, the *degree of memory localization* of such an AI system relative to S may be conceived as the percentage of the system's internal elements that have a high degree of membership in the internal image of an average element of S.

Of course, this characterization of localization has its limitations, such as the possibility of ambiguity regarding what are the "system elements" of a given AI system; and the exclusive focus on internal images of external phenomena rather than representation of internal abstract concepts. However, our goal here is not to formulate an ultimate, rigorous and thorough ontology of memory systems, but only to pose a "rough and ready" categorization so as to properly frame our discussion of some specific AGI issues relevant to CogPrime. Clearly the ideas pursued here will benefit from further theoretical exploration and elaboration.

In this sense, a Hopfield neural net [Ami89] would be considered "globalist" since it has a low degree of memory localization (most internal images heavily involve a large number of system elements); whereas Cyc would be considered "localist" as it has a very high degree of memory localization (most internal images are heavily focused on a small set of system elements).

However, although Hopfield nets and Cyc form handy examples, the "globalist vs. localist" distinction as described above is not identical to the "neural vs. symbolic" distinction. For it is in principle quite possible to create localist systems using formal neurons, and also to create globalist systems using formal logic. And "globalist-localist" is not quite identical to "symbolic vs emergentist" either, because the latter is about coordinated system dynamics and behavior not just about knowledge representation. CogPrime combines both symbolic and (loosely) neural representations, and also combines globalist and localist representations in a way that we will call "glocal" and analyze more deeply in Chapter 13; but there are many other ways these various

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properties could be manifested by AI systems. Rigorously studying the corpus of existing (or hypothetical!) cognitive architectures using these ideas would be a large task, which we do not undertake here.

In the next sections we review several hybrid architectures in more detail, focusing most deeply on LIDA and MicroPsi which have been directly inspirational for CogPrime.

4.5.1 CLARION

Ron Sun's CLARION architecture (see Figure 4.9) is interesting in its combination of symbolic and neural aspects – a combination that is used in a sophisticated way to embody the distinction and interaction between implicit and explicit mental processes. From a CLARION perspective, architectures like Soar and ACT-R are severely limited in that they deal only with explicit knowledge and associated learning processes.

CLARION consists of a number of distinct subsystems, each of which contains a dual representational structure, including a "rules and chunks" symbolic knowledge store somewhat similar to ACT-R, and a neural net knowledge store embodying implicit knowledge. The main subsystems are:

- An action-centered subsystem to control actions;
- A non-action-centered subsystem to maintain general knowledge;
- A motivational subsystem to provide underlying motivations for perception, action, and cognition;
- A meta-cognitive subsystem to monitor, direct, and modify the operations of all the other subsystems.

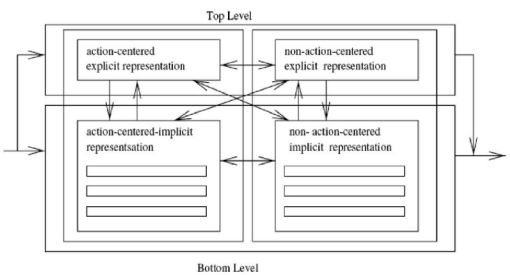

Fig. 4.9: The CLARION cognitive architecture.

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4.5.2 The Society of Mind and the Emotion Machine

In his influential but controversial book *The Society of Mind* [Min88], Marvin Minsky described a model of human intelligence as something that is built up from the interactions of numerous simple agents. He spells out in great detail how various particular cognitive functions may be achieved via agents and their interactions. He leaves no room for any central algorithms or structures of thought, famously arguing: "What magical trick makes us intelligent? The trick is that there is no trick. The power of intelligence stems from our vast diversity, not from any single, perfect principle."

This perspective was extended in the more recent work *The Emotion Machine* [Min07], where Minsky argued that emotions are "ways to think" evolved to handle different "problem types" that exist in the world. The brain is posited to have rule-based mechanisms (selectors) that turns on emotions to deal with various problems.

Overall, both of these works serve better as works of speculative cognitive science than as works of AI or cognitive architecture per se. As neurologist Richard Restak said in his review of *Emotion Machine*, "Minsky does a marvelous job parsing other complicated mental activities into simpler elements. ... But he is less effective in relating these emotional functions to what's going on in the brain." As Restak added, he is also not so effective at relating these emotional functions to straightforwardly implementable algorithms or data structures.

Push Singh, in his PhD thesis and followup work [SBC05], did the best job so far of creating a concrete AI design based on Minsky's ideas. While Singh's system was certainly interesting, it was also noteworthy for its lack of any learning mechanisms, and its exclusive focus on explicit rather than implicit knowledge. Due to Singh's tragic death, his work was never brought anywhere near completion. It seems fair to say that there has not yet been a serious cognitive architecture posed based closely on Minsky's ideas.

4.5.3 DUAL

The closest thing to a Minsky-ish cognitive architecture is probably DUAL, which takes the Society of Mind concept and adds to it a number of other interesting ideas. DUAL integrates symbolic and connectionist approaches at a deeper level than CLARION, and has been used to model various cognitive functions such as perception, analogy and judgment. Computations in DUAL emerge from the self-organized interaction of many micro-agents, each of which is a hybrid symbolic/connectionist device. Each DUAL agent plays the role of a neural network node, with an activation level and activation spreading dynamics; but also plays the role of a symbol, manipulated using formal rules. The agents exchange messages and activation via links that can be learned and modified, and they form coalitions which collectively represent concepts, episodes, and facts.

The structure of the model is sketchily depicted in Figure 4.10, which covers the application of DUAL to a toy environment called TextWorld. The visual input corresponding to a stimulus is presented on a two-dimensional visual array representing the front end of the system. Perceptual primitives like blobs and terminations are immediately generated by cheap parallel computations. Attention is controlled at each time by an object which allocates it selectively to some area of the stimulus. A detailed symbolic representation is constructed for this area which tends to fade away as attention is withdrawn from it and allocated to another one. Cate-

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gorization of visual memory contents takes place by retrieving object and scene categories from DUAL's semantic memory and mapping them onto current visual memory representations.

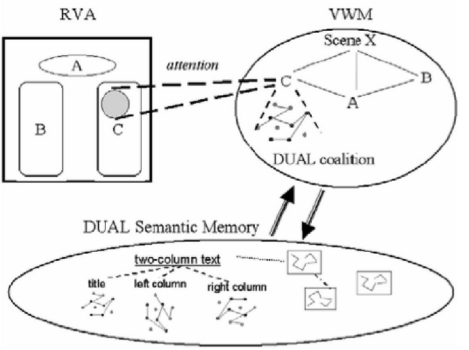

Fig. 4.10: The three main components of the DUAL model: the retinotopic visual array (RVA), the visual working memory (VWM) and DUAL's semantic memory. Attention is allocated to an area of the visual array by the object in VWM controlling attention, while scene and object categories corresponding to the contents of VWM are retrieved from the semantic memory.

In principle the DUAL framework seems quite powerful; using the language of CogPrime, however, it seems to us that the learning mechanisms of DUAL have not been formulated in such a way as to give rise to powerful, scalable cognitive synergy. It would likely be possible to create very powerful AGI systems within DUAL, and perhaps some very CogPrime -like systems as well. But the systems that have been created or designed for use within DUAL so far seem not to be that powerful in their potential or scope.

4.5.4 4D/RCS

In a rather different direction, James Albus, while at the National Bureau of Standards, developed a very thorough and impressive architecture for intelligent robotics called 4D/RCS, which was implemented in a number of machines including unmanned automated vehicles. This architecture lacks critical aspects of intelligence such as learning and creativity, but combines perception, action, planning and world-modeling in a highly effective and tightly-integrated fashion.

The architecture has three hierarchies of memory/processing units: one for perception, one for action and one for modeling and guidance. Each unit has a certain spatiotemporal scope,

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and (except for the lowest level) supervenes over children whose spatiotemporal scope is a subset of its own. The action hierarchy takes care of decomposing tasks into subtasks; whereas the sensation hierarchy takes care of grouping signals into entities and events. The modeling/guidance hierarchy mediates interactions between perception and action based on its understanding of the world and the system's goals.

In his book [AM01] Albus describes methods for extending 4D/RCS into a complete cognitive architecture, but these extensions have not been elaborated in full detail nor implemented.

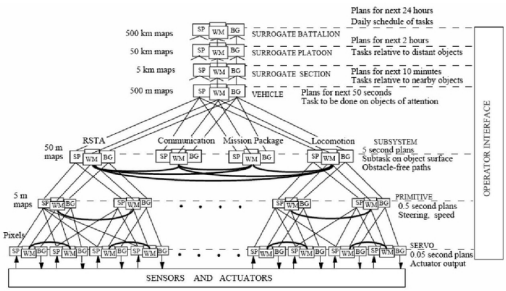

Fig. 4.11: Albus's 4D-RCS architecture for a single vehicle

4.5.5 PolyScheme

Nick Cassimatis's PolyScheme architecture [Cas07] shares with GLAIR the use of multiple logical reasoning methods on a common knowledge store. While its underlying ideas are quite general, currently PolyScheme is being developed in the context of the "object tracking" domain (construed very broadly). As a logic framework PolyScheme is fairly conventional (unlike GLAIR or NARS with their novel underlying formalisms), but PolyScheme has some unique conceptual aspects, for instance its connection with Cassimatis's theory of mind, which holds that the same core set of logical concepts and relationships underlies both language and physical reasoning [Cas04]. This ties in with the use of a common knowledge store for multiple cognitive processes; for instance it suggests that

- the same core relationships can be used for physical reasoning and parsing, but that each of these domains may involve some additional relationships.
- language processing may be done via physical-reasoning-based cognitive processes, plus the additional activity of some language-specific processes

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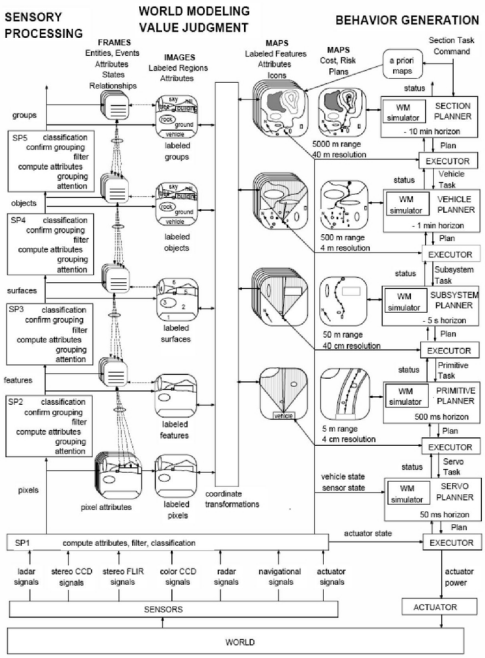

Fig. 4.12: Albus's perceptual, motor and modeling hierarchies

4.5.6 Joshua Blue

Sam Adams and his colleagues at IBM have created a cognitive architecture called Joshua Blue [AABL02], which has some significant similarities to CogPrime. Similar to our current research direction with CogPrime, Joshua Blue was created with loose emulation of child cognitive development in mind; and, also similar to CogPrime, it features a number of cognitive processes acting on a common neural-symbolic knowledge store. The specific cognitive processes involved in Joshua Blue and CogPrime are not particularly similar, however. At time of writing (2012)

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Joshua Blue is not under active development and has not been for some time; however, the project may be reanimated in future.

Joshua Blue's core knowledge representation is a semantic network of nodes connected by links along which activation spreads. Although many of the nodes have specific semantic referents, as in a classical semantic net, the spread of activation through the network is designed to lead to the emergence of "assemblies" (which could also be thought of as dynamical attractors) in a manner more similar to an attractor neural network.

A major difference from typical semantic or neural network models is the central role that affect plays in the system's dynamics. The weights of the links in the knowledge base are adjusted dynamically based on the emotional context – a very direct way of ensuring that cognitive processes and mental representations are continuously influenced by affect. Qualitatively, this mimics the way that particular emotions in the human brain correlate with the dissemination throughout the brain of particular neurotransmitters, which then affect synaptic activity.

A result of this architecture is that in Joshua Blue, emotion directs attention in a very direct way: affective weighting is important in determining which associated objects will become part of the focus of attention, or will be retained from memory. A notable similarity between CogPrime and Joshua Blue is that in both systems, nodes are assigned two quantitative attention values, one governing allocation of current system resources (mainly processor time; this is CogPrime's ShortTermImportance) and one governing the long-term allocation of memory (CogPrime's LongTermImportance).

The concrete work done with Joshua Blue involved using it to control a simple agent in a simulated world, with the goal that via human interaction, the agent would develop a complex and humanlike emotional and motivational structure from its simple in-built emotions and drives, and would then develop complex cognitive capabilities as part of this development process.

4.5.7 LIDA

The LIDA architecture developed by Stan Franklin and his colleagues [BF09] is based on the concept of the "cognitive cycle" - a notion that is important to nearly every BICA (Biologically Inspired Cognitive Architectures) and also to the brain, but that plays a particularly central role in LIDA. As Franklin says, "as a matter of principle, every autonomous agent, be it human, animal, or artificial, must frequently sample (sense) its environment, process (make sense of) this input, and select an appropriate response (action). The agent's "life" can be viewed as consisting of a continual sequence of iterations of these cognitive cycles. Such cycles constitute the indivisible elements of attention, the least sensing and acting to which we can attend. A cognitive cycle can be thought of as a moment of cognition, a cognitive "moment"."

4.5.8 The Global Workspace

LIDA is heavily based on the "global workspace" concept developed by Bernard Baars. As this concept is also directly relevant to CogPrime it is worth briefly describing here.

In essence Baars' Global Workspace Theory (GWT) is a particular hypothesis about how working memory works and the role it plays in the mind. Baars conceives working memory as the

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"inner domain in which we can rehearse telephone numbers to ourselves or, more interestingly, in which we carry on the narrative of our lives. It is usually thought to include inner speech and visual imagery." Baars uses the term "consciousness" to refer to the contents of working memory – a theoretical commitment that is not part of the CogPrime design. In this section we will use the term "consciousness" in Baars' way, but not throughout the rest of the book.

Baars conceives working memory and consciousness in terms of a "theater metaphor" – according to which, in the "theater of consciousness" a "spotlight of selective attention" shines a bright spot on stage. The bright spot reveals the global workspace – the contents of consciousness, which may be metaphorically considered as a group of actors moving in and out of consciousness, making speeches or interacting with each other. The unconscious is represented by the audience watching the play ... and there is also a role for the director (the mind's executive processes) behind the scenes, along with a variety of helpers like stage hands, script writers, scene designers, etc.

GWT describes a fleeting memory with a duration of a few seconds. This is much shorter than the 10-30 seconds of classical working memory – according to GWT there is a very brief "cognitive cycle" in which the global workspace is refreshed, and the time period an item remains in working memory generally spans a large number of these elementary "refresh" actions. GWT contents are proposed to correspond to what we are conscious of, and are said to be broadcast to a multitude of unconscious cognitive brain processes. Unconscious processes, operating in parallel, can form coalitions which can act as input processes to the global workspace. Each unconscious process is viewed as relating to certain goals, and seeking to get involved with coalitions that will get enough importance to become part of the global workspace – because once they're in the global workspace they'll be allowed to broadcast out across the mind as a whole, which include broadcasting to the internal and external actuators that allow the mind to do things. Getting into the global workspace is a process's best shot at achieving its goals.

Obviously, the theater metaphor used to describe the GWT is evocative but limited; for instance, the unconscious in the mind does a lot more than the audience in a theater. The unconscious comes up with complex creative ideas sometimes, which feed into consciousness – almost as if the audience is also the scriptwriter. Baars' theory, with its understanding of unconscious dynamics in terms of coalition-building, fails to describe the subtle dynamics occurring within the various forms of long-term memory, which result in subtle nonlinear interactions between long term memory and working memory. But nevertheless, GWT successfully models a number of characteristics of consciousness, including its role in handling novel situations, its limited capacity, its sequential nature, and its ability to trigger a vast range of unconscious brain processes. It is the framework on which LIDA's theory of the cognitive cycle is built.

4.5.9 The LIDA Cognitive Cycle

The simplest cognitive cycle is that of an animal, which senses the world, compares sensation to memory, and chooses an action, all in one fluid subjective moment. But the same cognitive cycle structure/process applies to higher-level cognitive processes as well. The LIDA architecture is based on the LIDA model of the cognitive cycle, which posits a particular structure underlying the cognitive cycle that possess the generality to encompass both simple and complex cognitive moments.

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The LIDA cognitive cycle itself is a theoretical construct that can be implemented in many ways, and indeed other BICAs like CogPrime and Psi also manifest the LIDA cognitive cycle in their dynamics, though utilizing different particular structures to do so.

Figure 4.13 shows the cycle pictorially, starting in the upper left corner and proceeding clockwise. At the start of a cycle, the LIDA agent perceives its current situation and allocates attention differentially to various parts of it. It then broadcasts information about the most important parts (which constitute the agent's consciousness), and this information gets features extracted from it, when then get passed along to episodic and semantic memory, that interact in the "global workspace" to create a model for the agent's current situation. This model then, in interaction with procedural memory, enables the agent to choose an appropriate action and execute it - the critical "action-selection" phase!

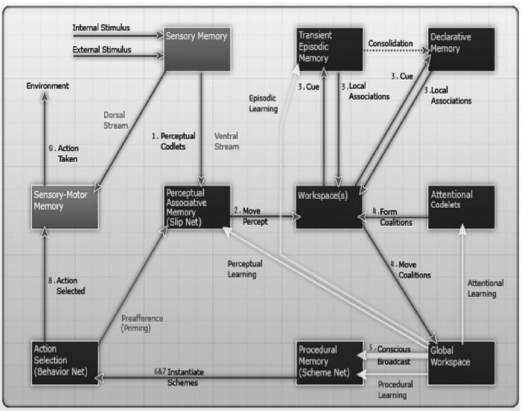

Fig. 4.13: The LIDA Cognitive Cycle

The LIDA Cognitive Cycle in More Depth

[2]

We now run through the cognitive cycle in more detail. It begins with sensory stimuli from the agent's external internal environment. Low-level feature detectors in sensory memory begin the process of making sense of the incoming stimuli. These low-level features are passed to perceptual memory where higher-level features, objects, categories, relations, actions, situations,

[2] This section paraphrases heavily from [Fra06]

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etc. are recognized. These recognized entities, called percepts, are passed to the workspace, where a model of the agent's current situation is assembled.

Workspace structures serve as cues to the two forms of episodic memory, yielding both short and long term remembered local associations. In addition to the current percept, the workspace contains recent percepts that haven't yet decayed away, and the agent's model of the then-current situation previously assembled from them. The model of the agent's current situation is updated from the previous model using the remaining percepts and associations. This updating process will typically require looking back to perceptual memory and even to sensory memory, to enable the understanding of relations and situations. This assembled new model constitutes the agent's understanding of its current situation within its world. Via constructing the model, the agent has made sense of the incoming stimuli.

Now attention allocation comes into play, because a real agent lacks the computational resources to work with all parts of its world-model with maximal mental focus. Portions of the model compete for attention. These competing portions take the form of (potentially overlapping) coalitions of structures comprising parts the model. Once one such coalition wins the competition, the agent has decided what to focus its attention on.

And now comes the purpose of all this processing: to help the agent to decide what to do next. The winning coalition passes to the global workspace, the namesake of Global Workspace Theory, from which it is broadcast globally. Though the contents of this conscious broadcast are available globally, the primary recipient is procedural memory, which stores templates of possible actions including their context and possible results.

Procedural memory also stores an activation value for each such template – a value that attempts to measure the likelihood of an action taken within its context producing the expected result. It's worth noting that LIDA makes a rather specific assumption here. LIDA's "activation" values are like the probabilistic truth values of the implications in CogPrime's $Context \wedge Procedure \rightarrow Goal$ triples. However, in CogPrime this probability is not the same as the ShortTermImportance "attention value" associated with the Implication link representing that implication. Here LIDA merges together two concepts that in CogPrime are separate.

Templates whose contexts intersect sufficiently with the contents of the conscious broadcast instantiate copies of themselves with their variables specified to the current situation. These instantiations are passed to the action selection mechanism, which chooses a single action from these instantiations and those remaining from previous cycles. The chosen action then goes to sensorimotor memory, where it picks up the appropriate algorithm by which it is then executed. The action so taken affects the environment, and the cycle is complete.

The LIDA model hypothesizes that all human cognitive processing is via a continuing iteration of such cognitive cycles. It acknowledges that other cognitive processes may also occur, refining and building on the knowledge used in the cognitive cycle (for instance, the cognitive cycle itself doesn't mention abstract reasoning or creativity). But the idea is that these other processes occur in the context of the cognitive cycle, which is the main loop driving the internal and external activities of the organism.

4.5.9.1 Avoiding Combinatorial Explosion via Adaptive Attention Allocation

LIDA avoids combinatorial explosions in its inference processes via two methods, both of which are also important in CogPrime :

- combining reasoning via association with reasoning via deduction

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- foundational use of uncertainty in reasoning

One can create an analogy between LIDA's workspace structures and codelets and a logic-based architecture's assertions and functions. However, LIDA's codelets only operate on the structures that are active in the workspace during any given cycle. This includes recent perceptions, their closest matches in other types of memory, and structures recently created by other codelets. The results with the highest estimate of success, i.e. activation, will then be selected.

Uncertainty plays a role in LIDA's reasoning in several ways, most notably through the base activation of its behavior codelets, which depend on the model's estimated probability of the codelet's success if triggered. LIDA observes the results of its behaviors and updates the base activation of the responsible codelets dynamically.

We note that for this kind of uncertain inference/activation interplay to scale well, some level of cognitive synergy must be present; and based on our understanding of LIDA it is not clear to us whether the particular inference and association algorithms used in LIDA possess the requisite synergy.

4.5.9.2 LIDA versus CogPrime

The LIDA cognitive cycle, broadly construed, exists in CogPrime as in other cognitive architectures. To see how, it suffices to map the key LIDA structures into corresponding CogPrime structures, as is done in Table 4.1. Of course this table does not cover all CogPrime processes, as LIDA does not constitute a thorough explanation of CogPrime structure and dynamics. And in most cases the corresponding CogPrime and LIDA processes don't work in exactly the same way; for instance, as noted above, LIDA's action selection relies solely on LIDA's "activation" values, whereas CogPrime's action selection process is more complex, relying on aspects of CogPrime that lack LIDA analogues.

4.5.10 Psi and MicroPsi

We have saved for last the architecture that has the most in common with CogPrime : Joscha Bach's MicroPsi architecture, closely based on Dietrich Dorner's Psi theory. CogPrime has borrowed substantially from Psi in its handling of emotion and motivation; but Psi also has other aspects that differ considerably from CogPrime. Here we will focus more heavily on the points of overlap, but will mention the key points of difference as well.

The overall Psi cognitive architecture, which is centered on the Psi model of the motivational system, is roughly depicted in Figure 4.14.

Psi's motivational system begins with **Demands**, which are the basic factors that motivate the agent. For an animal these would include things like food, water, sex, novelty, socialization, protection of one's children, and so forth. For an intelligent robot they might include things like electrical power, novelty, certainty, socialization, well-being of others and mental growth.

Psi also specifies two fairly abstract demands and posits them as psychologically fundamental (see Figure 4.15):

- **competence**, the effectiveness of the agent at fulfilling its Urges
- **certainty**, the confidence of the agent's knowledge

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LIDA	CogPrime
Declarative memory	Atomspace
attentional codelets	Schema that adjust importance of Atoms explicitly
coalitions	maps
global workspace	attentional focus
behavior codelets	schema
procedural memory (scheme net)	procedures in ProcedureRepository; and network of SchemaNodes in the Atomspace
action selection (behavior net)	propagation of STICurrency from goals to actions, and action selection process
transient episodic memory	perceptual atoms entering AT with high STI, which rapidly decreases in most cases
local workspaces	bubbles of interlinked Atoms with moderate importance, focused on by a subset of MindAgents (defined in Chapter 19 of Part 2) for a period of time
perceptual associative memory	HebbianLinks in the AT
sensory memory	spaceserver/timeserver, plus auxiliary stores for other senses
sensorimotor memory	Atoms storing record of actions taken, linked in with Atoms indexed in sensory memory

Table 4.1: CogPrime Analogues of Key LIDA Features

Each demand is assumed to come with a certain "target level" or "target range" (and these may fluctuate over time, or may change as a system matures and develops). An **Urge** is said to develop when a demand deviates from its target range: the urge then seeks to return the demand to its target range. For instance, in an animal-like agent the demand related to food is more clearly described as "fullness," and there is a target range indicating that the agent is neither too hungry nor too full of food. If the agent's fullness deviates from this range, an Urge to return the demand to its target range arises. Similarly, if an agent's novelty deviates from its target range, this means the agent's life has gotten either too boring or too disconcertingly weird, and the agent gets an Urge for either more interesting activities (in the case of below-range novelty) or more familiar ones (in the case of above-range novelty).

There is also a primitive notion of **Pleasure** (and its opposite, displeasure), which is considered as different from the complex emotion of "happiness." Pleasure is understood as associated with Urges: pleasure occurs when an Urge is (at least partially) satisfied, whereas displeasure occurs when an urge gets increasingly severe. The degree to which an Urge is satisfied is not necessarily defined instantaneously; it may be defined, for instance, as a time-decaying weighted average of the proximity of the demand to its target range over the recent past.

So, for instance if an agent is bored and gets a lot of novel stimulation, then it experiences some pleasure. If it's bored and then the monotony of its stimulation gets even more extreme, then it experiences some displeasure.

Note that, according to this relatively simplistic approach, any decrease in the amount of dissatisfaction causes some pleasure; whereas if everything always continues within its acceptable range, there isn't any pleasure. This may seem a little counterintuitive, but it's important to understand that these simple definitions of "pleasure" and "displeasure" are not intended to fully capture the natural language concepts associated with those words. The natural language terms are used here simply as heuristics to convey the general character of the processes in-

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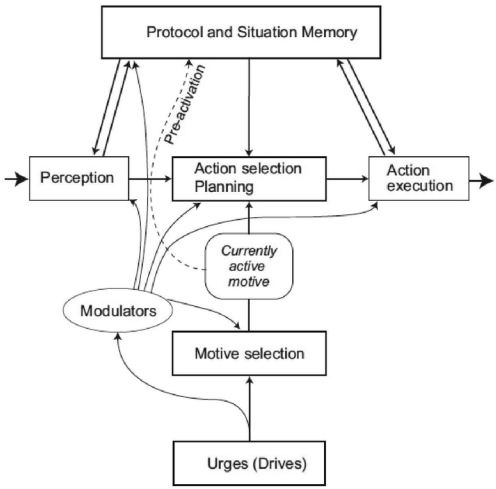

Fig. 4.14: High-Level Architecture of the Psi Model

volved. These are very low level processes whose analogues in human experience are largely below the conscious level.

A **Goal** is considered as a statement that the system may strive to make true at some future time. A **Motive** is an $(urge, goal)$ pair, consisting of a goal whose satisfaction is predicted to imply the satisfaction of some urge. In fact one may consider Urges as top-level goals, and the agent's other goals as their subgoals.

In Psi an agent has one "ruling motive" at any point in time, but this seems an oversimplification more applicable to simple animals than to human-like or other advanced AI systems. In general one may think of different motives having different weights indicating the amount of resources that will be spent on pursuing them.

Emotions in Psi are considered as complex systemic response-patterns rather than explicitly constructed entities. An emotion is the set of mental entities activated in response to a certain set of urges. Dorner conceived theories about how various common emotions emerge from the dynamics of urges and motives as described in the Psi model. "Intentions" are also considered as composite entities: an intention at a given point in time consists of the active motives, together with their related goals, behavior programs and so forth.

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The basic logic of action in Psi is carried out by "triples" that are very similar to CogPrime's *Context* ∧ *Procedure* → *Goal* triples. However, an important role is played by four **modulators** that control how the processes of perception, cognition and action selection are regulated at a given time:

- *activation*, which determines the degree to which the agent is focused on rapid, intensive activity versus reflective, cognitive activity
- *resolution level*, which determines how accurately the system tries to perceive the world
- *certainty*, which determines how hard the system tries to achieve definite, certain knowledge
- *selection threshold*, which determines how willing the system is to change its choice of which goals to focus on

These modulators characterize the system's emotional and cognitive state at a very abstract level; they are not emotions per se, but they have a large effect on the agent's emotions. Their intended interaction is depicted in Figure 4.15.

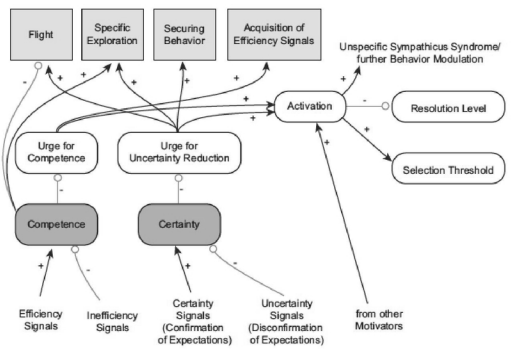

Fig. 4.15: Primary Interrelationships Between Psi Modulators

4.5.11 The Emergence of Emotion in the Psi Model

We now briefly review the specifics of how Psi models the emergence of emotion. The basic idea is to define a small set of **proto-emotional dimensions** in terms of basic Urges and modulators. Then, emotions are identified with regions in the space spanned by these dimensions.

The simplest approach uses a six-dimensional continuous space:

1. pleasure

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2. arousal
3. resolution level
4. selection threshold (i.e. degree of dominance of the leading motive)
5. level of background checks (the rate of the securing behavior)
6. level of goal-directed behavior

Figure 4.16 shows how the latter 5 of these dimensions are derived from underlying urges and modulators. Note that these dimensions are not orthogonal; for instance resolution is mainly inversely related to arousal. Additional dimensions are also discussed, for instance it is postulated that to deal with social emotions one may wish to introduce two more demands corresponding to inner and outer obedience to social norms, and then define dimensions in terms of these.

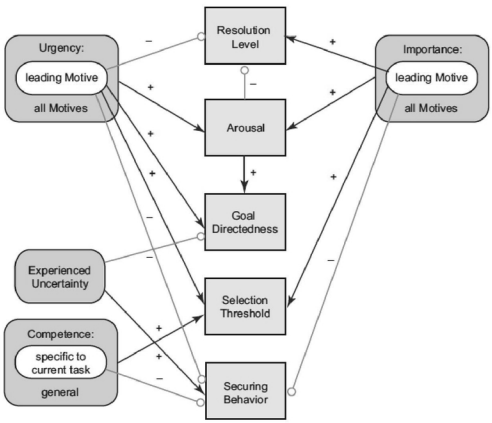

Fig. 4.16: Five Proto-Emotional Dimensions Implicit in the Psi Model

Specific emotions are then characterized in terms of these dimensions. According to [Bac09], for instance, "Anger ... is characterized by high arousal, low resolution, strong motive dominance, few background checks and strong goal-orientedness; sadness by low arousal, high resolution, strong dominance, few background-checks and low goal-orientedness."

I'm a bit skeptical of the contention that these dimensions *fully* characterize the relevant emotions. Anger for instance seems to have some particular characteristics not implied by the above list of dimensional values. The list of dimensional values associated with anger doesn't tell us that an angry person is more likely to punch someone than to bounce up and down, for example. However, it does seem that the dimensional values associated with an emotion are

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informative about the emotion, so that positioning an emotion on the given dimensions tells one a lot.

4.5.12 Knowledge Representation, Action Selection and Planning in Psi

In addition to the basic motivation/emotion architecture of Psi, which has been adopted (with some minor changes) for use in CogPrime, Psi has a number of other aspects that are somewhat different from their CogPrime analogues.

First of all, on the micro level, Psi represents knowledge using structures called "quads." Each quad is a cluster of 5 neurons containing a core neuron, and four other neurons representing before/after and part-of/has-part relationships in regard to that core neuron. Quads are naturally assembled into spatiotemporal hierarchies, though they are not required to form part of such a structure.

Psi stores knowledge using quads arranged in three networks, which are conceptually similar to the networks in Albus's 4D/RCS and Arel's DeSTIN architectures:

- A sensory network, which stores declarative knowledge: schemas representing images, objects, events and situations as hierarchical structures.
- A motor network, which contains procedural knowledge by way of hierarchical behavior programs
- A motivational network handling demands

Perception in Psi, which is centered in the sensory network, follows principles similar to DeSTIN (which are shared also by other systems), for instance the principle of *perception as prediction*. Psi's "HyPercept" mechanism performs hypothesis-based perception: it attempts to predict what is there to be perceived and then attempts to verify these predictions using sensation and memory. Furthermore HyPercept is intimately coupled with actions in the external world, according to the concept of "Neisser's perceptual cycle," the cycle between exploration and representation of reality. Perceptually acquired information is translated into schemas capable of guiding behaviors, and these are enacted (sometimes affecting the world in significant ways) and in the process used to guide further perception. Imaginary perceptions are handled via a "mental stage" analogous to CogPrime's internal simulation world.

Action selection in Psi works based on what are called "triplets," each of which consists of

- a sensor schema (pre-conditions, "condition schema"; like CogPrime's "context")
- a subsequent motor schema (action, effector; like CogPrime's "procedure")
- a final sensor schema (post-conditions, expectations; like an CogPrime predicate or goal)

What distinguishes these triplets from classic production rules as used in (say) Soar and ACT-R is that the triplets may be partial (some of the three elements may be missing) and may be uncertain. However, there seems no fundamental difference between these triplets and CogPrime's concept/procedure/goal triplets, at a high level; the difference lies in the underlying knowledge representation used for the schemata, and the probabilistic logic used to represent the implication.

The work of figuring out what schema to execute to achieve the chosen goal in the current context is done in Psi using a combination of processes called the "Rasmussen ladder" (named

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after Danish psychologist Jens Rasmussen). The Rasmussen ladder describes the organization of action as a movement between the stages of skill-based behavior, rule-based behavior and knowledge-based behavior, as follows:

- If a given task amounts to a trained routine, an automatism or skill is activated; it can usually be executed without conscious attention and deliberative control.
- If there is no automatism available, a course of action might be derived from rules; before a known set of strategies can be applied, the situation has to be analyzed and the strategies have to be adapted.
- In those cases where the known strategies are not applicable, a way of combining the available manipulations (operators) into reaching a given goal has to be explored at first. This stage usually requires a recomposition of behaviors, that is, a planning process.

The planning algorithm used in the Psi and MicroPsi implementations is a fairly simple hill-climbing planner. While it's hypothesized that a more complex planner may be needed for advanced intelligence, part of the Psi theory is the hypothesis that most real-life planning an organism needs to do is fairly simple, once the organism has the right perceptual representations and goals.

4.5.13 Psi versus CogPrime

On a high level, the similarities between Psi and CogPrime are quite strong:

- interlinked declarative, procedural and intentional knowledge structures, represented using neural-symbolic methods (though, the knowledge structures have somewhat different high-level structures and low-level representational mechanisms in the two systems)
- perception via prediction and perception/action integration
- action selection via triplets that resemble uncertain, potentially partial production rules
- similar motivation/emotion framework, since CogPrime incorporates a variant of Psi for this

On the nitty-gritty level there are many differences between the systems, but on the big-picture level the *main* difference lies in the way the cognitive synergy principle is pursued in the two different approaches. Psi and MicroPsi rely on very simple learning algorithms that are closely tied to the "quad" neurosymbolic knowledge representation, and hence interoperate in a fairly natural way without need for subtle methods of "synergy engineering." CogPrime uses much more diverse and sophisticated learning algorithms which thus require more sophisticated methods of interoperation in order to achieve cognitive synergy.

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Chapter 5
A Generic Architecture of Human-Like Cognition

5.1 Introduction

When writing the first draft of this book, some years ago, we had the idea to explain CogPrime by aligning its various structures and processes with the ones in the "standard architecture diagram" of the human mind. After a bit of investigation, though, we gradually came to the realization that no such thing existed. There was no standard flowchart or other sort of diagram explaining the modern consensus on how human thought works. Many such diagrams existed, but each one seemed to represent some particular focus or theory, rather than an overall integrative understanding.

Since there are multiple opinions regarding nearly every aspect of human intelligence, it would be difficult to get two cognitive scientists to fully agree on every aspect of an overall human cognitive architecture diagram. Prior attempts to outline detailed mind architectures have tended to follow highly specific theories of intelligence, and hence have attracted only moderate interest from researchers not adhering to those theories. An example is Minsky's work presented in *The Emotion Machine* [Min07], which arguably does constitute an architecture diagram for the human mind, but which is only loosely grounded in current empirical knowledge and stands more as a representation of Minsky's own intuitive understanding.

But nevertheless, it seemed to us that a reasonable attempt at an integrative, relatively theory-neutral "human cognitive architecture diagram" would be better than nothing. So naturally, we took it on ourselves to create such a diagram. This chapter is the result – it draws on the thinking of a number of cognitive science and AGI researchers, integrating their perspectives in a coherent, overall architecture diagram for human, and human-like, general intelligence. The specific architecture diagram of CogPrime, given in Chapter 6 below, may then be understood as a particular instantiation of this generic architecture diagram of human-like cognition.

There is no getting around the fact that, to a certain extent, the diagram presented here reflects our particular understanding of how the mind works. However, it was intentionally constructed with the goal of *not* being just an abstracted version of the CogPrime architecture diagram! It does not reflect our own idiosyncratic understanding of human intelligence, as much as a combination of understandings previously presented by multiple researchers (including ourselves), arranged according to our own taste in a manner we find conceptually coherent. With this in mind, we call it the "Integrative Human-Like Cognitive Architecture Diagram," or for short "the integrative diagram." We have made an effort to ensure that as many pieces of the integrative diagram as possible are well grounded in psychological and even neuroscientific

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data, rather than mainly embodying speculative notions; however, given the current state of knowledge, this could not be done to a complete extent, and there is still some speculation involved here and there.

While based on understandings of human intelligence, the integrative diagram is intended to serve as an architectural outline for human-like general intelligence more broadly. For example, CogPrime is explicitly not intended as a precise emulation of human intelligence, and does many things quite differently than the human mind, yet can still fairly straightforwardly be mapped into the integrative diagram.

The integrative diagram focuses on *structure*, but this should not be taken to represent a valuation of structure over dynamics in our approach to intelligence. Following chapters treat various dynamical phenomena in depth.

5.2 Key Ingredients of the Integrative Human-Like Cognitive Architecture Diagram

The main ingredients we've used in assembling the integrative diagram are as follows:

- Our own views on the various types of memory critical for human-like cognition, and the need for tight, "synergetic" interactions between the cognitive processes focused on these
- Aaron Sloman's high-level architecture diagram of human intelligence [Slo01], drawn from his CogAff architecture, which strikes me as a particularly clear embodiment of "modern common sense" regarding the overall architecture of the human mind. We have added only a couple items to Sloman's high-level diagram, which we felt deserved an explicit high-level role that he did not give them: emotion, language and reinforcement.
- The LIDA architecture diagram presented by Stan Franklin and Bernard Baars [BF09]. We think LIDA is an excellent model of working memory and what Sloman calls "reactive processes", with well-researched grounding in the psychology and neuroscience literature. We have adapted the LIDA diagram only very slightly for use here, changing some of the terminology on the arrows, and indicating where parts of the LIDA diagram indicate processes elaborated in more detail elsewhere in the integrative diagram.
- The architecture diagram of the Psi model of motivated cognition, presented by Joscha Bach in [Bac09] based on prior work by Dietrich Dorner [Dör02]. This diagram is presented without significant modification; however it should be noted that Bach and Dorner present this diagram in the context of larger and richer cognitive models, the other aspects of which are not all incorporated in the integrative diagram.
- James Albus's three-hierarchy model of intelligence [AM01], involving coupled perception, action and reinforcement hierarchies. Albus's model, utilized in the creation of intelligent unmanned automated vehicles, is a crisp embodiment of many ideas emergent from the field of intelligent control systems.
- Deep learning networks as a model of perception (and action and reinforcement learning), as embodied for example in the work of Itamar Arel [ARC09] and Jeff Hawkins [HB06]. The integrative diagram adopts this as the basic model of the perception and action subsystems of human intelligence. Language understanding and generation are also modeled according to this paradigm.

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One possible negative reaction to the integrative diagram might be to say that it's a kind of Frankenstein monster diagram, piecing together aspects of different theories in a way that violates the theoretical notions underlying all of them! For example, the integrative diagram takes LIDA as a model of working memory and reactive processing, but from the papers on LIDA it's unclear whether the creators of LIDA construe it more broadly than that. The deep learning community tends to believe that the architecture of current deep learning networks, in itself, is close to sufficient for human-level general intelligence – whereas the integrative diagram appropriates the ideas from this community mainly for handling perception, action and language, etc.

On the other hand, in a more positive perspective, one could view the integrative diagram as consistent with LIDA, but merely providing much more detail on some of the boxes in the LIDA diagram (e.g. dealing with perception and long-term memory). And one could view the integrative diagram as consistent with the deep learning paradigm – via viewing it, not as a description of components to be explicitly implemented in an AGI system, but rather as a description of the key structures and processes that must emerge in deep learning network, based on its engagement with the world, in order for it to achieve human-like general intelligence.

Our own view, underlying the creation of the integrative diagram, is that different communities of cognitive science researchers have focused on different aspects of intelligence, and have thus each created models that are more fully fleshed out in some aspects than others. But these various models all link together fairly cleanly, which is not surprising as they are all grounded in the same data regarding human intelligence. Many judgment calls must be made in fusing multiple models in the way that the integrative diagram does, but we feel these can be made without violating the spirit of the component models. In assembling the integrative diagram, we have made these judgment calls as best we can, but we're well aware that different judgments would also be feasible and defensible. Revisions are likely as time goes on, not only due to new data about human intelligence but also to evolution of understanding regarding the best approach to model integration.

Another possible argument against the ideas presented here is that there's nothing new – all the ingredients presented have been given before elsewhere. To this our retort is to quote Pascal: "Let no one say that I have said nothing new ... the arrangement of the subject is new." The various architecture diagrams incorporated into the integrative diagram are either extremely high level (Sloman's diagram) or focus primarily on one aspect of intelligence, treating the others very concisely by summarizing large networks of distinction structures and processes in small boxes. The integrative diagram seeks to cover all aspects of human-like intelligence at a roughly equal granularity – a different arrangement.

This kind of high-level diagramming exercise is not precise enough, nor dynamics-focused enough, to serve as a guide for creating human-level or more advanced AGI. But it can be a useful tool for explaining and interpreting a concrete AGI design, such as CogPrime.

5.3 An Architecture Diagram for Human-Like General Intelligence

The integrative diagram is presented here in a series of seven Figures.

Figure 5.1 gives a high-level breakdown into components, based on Sloman's high-level cognitive-architectural sketch [Slo01]. This diagram represents, roughly speaking, "modern common sense" about how a human-like mind is architected. The separation between structures

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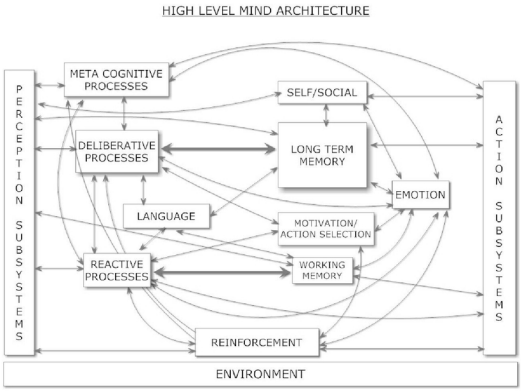

Fig. 5.1: High-Level Architecture of a Human-Like Mind

and processes, embodied in having separate boxes for Working Memory vs. Reactive Processes, and for Long Term Memory vs. Deliberative Processes, could be viewed as somewhat artificial, since in the human brain and most AGI architectures, memory and processing are closely integrated. However, the tradition in cognitive psychology is to separate out Working Memory and Long Term Memory from the cognitive processes acting thereupon, so we have adhered to that convention. The other changes from Sloman's diagram are the explicit inclusion of language, representing the hypothesis that language processing is handled in a somewhat special way in the human brain; and the inclusion of a reinforcement component parallel to the perception and action hierarchies, as inspired by intelligent control systems theory (e.g. Albus as mentioned above) and deep learning theory. Of course Sloman's high level diagram in its original form is intended as inclusive of language and reinforcement, but we felt it made sense to give them more emphasis.

Figure 5.2, modeling working memory and reactive processing, is essentially the LIDA diagram as given in prior papers by Stan Franklin, Bernard Baars and colleagues [BF09]. The boxes in the upper left corner of the LIDA diagram pertain to sensory and motor processing, which LIDA does not handle in detail, and which are modeled more carefully by deep learning theory. The bottom left corner box refers to action selection, which in the integrative diagram is modeled in more detail by Psi. The top right corner box refers to Long-Term Memory, which the integrative diagram models in more detail as a synergetic multi-memory system (Figure 5.4).

The original LIDA diagram refers to various "codelets", a key concept in LIDA theory. We have replaced "attention codelets" here with "attention flow", a more generic term. We suggest one can think of an attention codelet as: a piece of information stating that, for a certain group of items, it's currently pertinent to pay attention to this group as a collective.

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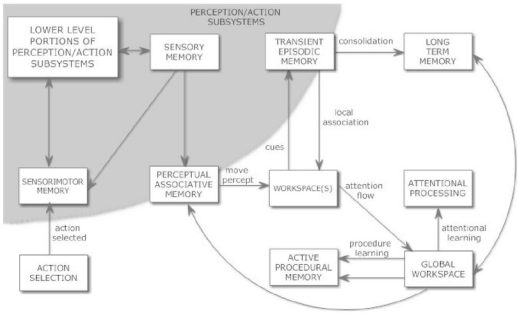

Fig. 5.2: Architecture of Working Memory and Reactive Processing, closely modeled on the LIDA architecture

Figure 5.3, modeling motivation and action selection, is a lightly modified version of the Psi diagram from Joscha Bach's book *Principles of Synthetic Intelligence* [Bac09]. The main difference from Psi is that in the integrative diagram the Psi motivated action framework is embedded in a larger, more complex cognitive model. Psi comes with its own theory of working and long-term memory, which is related to but different from the one given in the integrative diagram – it views the multiple memory types distinguished in the integrative diagram as emergent from a common memory substrate. Psi comes with its own theory of perception and action, which seems broadly consistent with the deep learning approach incorporated in the integrative diagram. Psi's handling of working memory lacks the detailed, explicit workflow of LIDA, though it seems broadly conceptually consistent with LIDA.

In Figure 5.3, the box labeled "Other portions of working memory" is labeled "Protocol and situation memory" in the original Psi diagram. The Perception, Action Execution and Action Selection boxes have fairly similar semantics to the similarly labeled boxes in the LIDA-like Figure 5.2, so that these diagrams may be viewed as overlapping. The LIDA model doesn't explain action selection and planning in as much detail as Psi, so the Psi-like Figure 5.3 could be viewed as an elaboration of the action-selection portion of the LIDA-like Figure 5.2. In Psi, reinforcement is considered as part of the learning process involved in action selection and planning; in Figure 5.3 an explicit "reinforcement box" has been added to the original Psi diagram, to emphasize this.

Figure 5.4, modeling long-term memory and deliberative processing, is derived from our own prior work studying the "cognitive synergy" between different cognitive processes associated with different types of memory. The division into types of memory is fairly standard. Declarative, procedural, episodic and sensorimotor memory are routinely distinguished; we like to distinguish attentional memory and intentional (goal) memory as well, and view these as the interface between long-term memory and the mind's global control systems. One focus of our AGI design work has been on designing learning algorithms, corresponding to these various types of memory,

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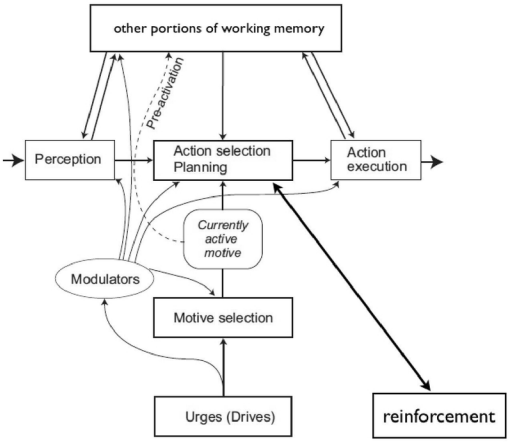

Fig. 5.3: Architecture of Motivated Action

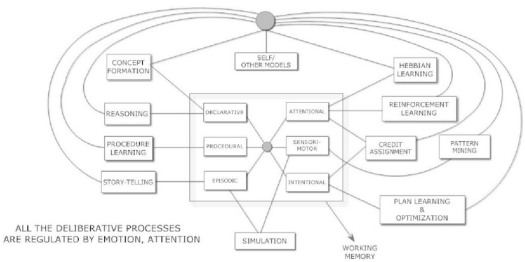

Fig. 5.4: Architecture of Long-Term Memory and Deliberative and Metacognitive Thinking

that interact with each other in a synergetic way [Goe09c], helping each other to overcome their intrinsic combinatorial explosions. There is significant evidence that these various types of long-term memory are differently implemented in the brain, but the degree of structure and dynamical commonality underlying these different implementations remains unclear.

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Each of these long-term memory types has its analogue in working memory as well. In some cognitive models, the working memory and long-term memory versions of a memory type and corresponding cognitive processes, are basically the same thing. CogPrime is mostly like this – it implements working memory as a subset of long-term memory consisting of items with particularly high importance values. The distinctive nature of working memory is enforced via using slightly different dynamical equations to update the importance values of items with importance above a certain threshold. On the other hand, many cognitive models treat working and long term memory as more distinct than this, and there is evidence for significant functional and anatomical distinctness in the brain in some cases. So for the purpose of the integrative diagram, it seemed best to leave working and long-term memory subcomponents as parallel but distinguished.

Figure 5.4 also encompasses metacognition, under the hypothesis that in human beings and human-like minds, metacognitive thinking is carried out using basically the same processes as plain ordinary deliberative thinking, perhaps with various tweaks optimizing them for thinking about thinking. If it turns out that humans have, say, a special kind of reasoning faculty exclusively for metacognition, then the diagram would need to be modified. Modeling of self and others is understood to occur via a combination of metacognition and deliberative thinking, as well as via implicit adaptation based on reactive processing.

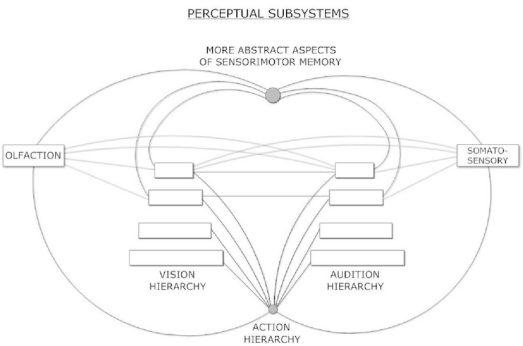

Fig. 5.5: Architecture for Multimodal Perception

Figure 5.5 models perception, according to the basic ideas of deep learning theory. Vision and audition are modeled as deep learning hierarchies, with bottom-up and top-down dynamics. The lower layers in each hierarchy refer to more localized patterns recognized in, and abstracted from, sensory data. Output from these hierarchies to the rest of the mind is not just through the top layers, but via some sort of sampling from various layers, with a bias toward the top layers. The different hierarchies cross-connect, and are hence to an extent dynamically coupled together. It is also recognized that there are some sensory modalities that aren't strongly hierarchical, e.g

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touch and smell (the latter being better modeled as something like an asymmetric Hopfield net, prone to frequent chaotic dynamics [LLW+05]) – these may also cross-connect with each other and with the more hierarchical perceptual subnetworks. Of course the suggested architecture could include any number of sensory modalities; the diagram is restricted to four just for simplicity.

The self-organized patterns in the upper layers of perceptual hierarchies may become quite complex and may develop advanced cognitive capabilities like episodic memory, reasoning, language learning, etc. A pure deep learning approach to intelligence argues that all the aspects of intelligence emerge from this kind of dynamics (among perceptual, action and reinforcement hierarchies). Our own view is that the heterogeneity of human brain architecture argues against this perspective, and that deep learning systems are probably better as models of perception and action than of general cognition. However, the integrative diagram is not committed to our perspective on this – a deep-learning theorist could accept the integrative diagram, but argue that all the other portions besides the perceptual, action and reinforcement hierarchies should be viewed as descriptions of phenomena that emerge in these hierarchies due to their interaction.

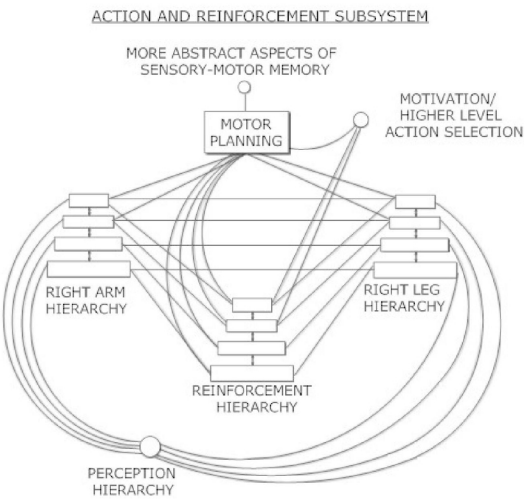

Fig. 5.6: Architecture for Action and Reinforcement

Figure 5.6 shows an action subsystem and a reinforcement subsystem, parallel to the perception subsystem. Two action hierarchies, one for an arm and one for a leg, are shown for

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concreteness, but of course the architecture is intended to be extended more broadly. In the hierarchy corresponding to an arm, for example, the lowest level would contain control patterns corresponding to individual joints, the next level up to groupings of joints (like fingers), the next level up to larger parts of the arm (hand, elbow). The different hierarchies corresponding to different body parts cross-link, enabling coordination among body parts; and they also connect at multiple levels to perception hierarchies, enabling sensorimotor coordination. Finally there is a module for motor planning, which links tightly with all the motor hierarchies, and also overlaps with the more cognitive, inferential planning activities of the mind, in a manner that is modeled different ways by different theorists. Albus [AM01] has elaborated this kind of hierarchy quite elaborately.

The reward hierarchy in Figure 5.6 provides reinforcement to actions at various levels on the hierarchy, and includes dynamics for propagating information about reinforcement up and down the hierarchy.

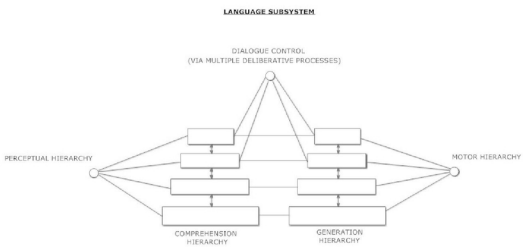

Fig. 5.7: Architecture for Language Processing

Figure 5.7 deals with language, treating it as a special case of coupled perception and action. The traditional architecture of a computational language comprehension system is a pipeline [JM09] [Goe10d], which is equivalent to a hierarchy with the lowest-level linguistic features (e.g. sounds, words) at the bottom, and the highest level features (semantic abstractions) at the top, and syntactic features in the middle. Feedback connections enable semantic and cognitive modulation of lower-level linguistic processing. Similarly, language generation is commonly modeled hierarchically, with the top levels being the ideas needing verbalization, and the bottom level corresponding to the actual sentence produced. In generation the primary flow is top-down, with bottom-up flow providing modulation of abstract concepts by linguistic surface forms.

So, that's it – an integrative architecture diagram for human-like general intelligence, split among seven different pictures, formed by judiciously merging together architecture diagrams produced via a number of cognitive theorists with different, overlapping foci and research paradigms.

Is anything critical left out of the diagram? A quick perusal of the table of contents of cognitive psychology textbooks suggests to me that if anything major is left out, it's also unknown to current cognitive psychology. However, one could certainly make an argument for explicit inclusion of certain other aspects of intelligence, that in the integrative diagram are

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left as implicit emergent phenomena. For instance, creativity is obviously very important to intelligence, but, there is no "creativity" box in any of these diagrams – because in our view, and the view of the cognitive theorists whose work we've directly drawn on here, creativity is best viewed as a process emergent from other processes that are explicitly included in the diagrams.

5.4 Interpretation and Application of the Integrative Diagram

A tongue-partly-in-cheek definition of a biological pathway is "a subnetwork of a biological network, that fits on a single journal page." Cognitive architecture diagrams have a similar property – they are crude abstractions of complex structures and dynamics, sculpted in accordance with the size of the printed page, and the tolerance of the human eye for absorbing diagrams, and the tolerance of the human author for making diagrams.

However, sometimes constraints – even arbitrary ones – are useful for guiding creative efforts, due to the fact that they force choices. Creating an architecture for human-like general intelligence that fits in a few (okay, seven) fairly compact diagrams, requires one to make many choices about what features and relationships are most essential. In constructing the integrative diagram, we have sought to make these choices, not purely according to our own tastes in cognitive theory or AGI system design, but according to a sort of blend of the taste and judgment of a number of scientists whose views we respect, and who seem to have fairly compatible, complementary perspectives.

What is the use of a cognitive architecture diagram like this? It can help to give newcomers to the field a basic idea about what is known and suspected about the nature of human-like general intelligence. Also, it could potentially be used as a tool for cross-correlating different AGI architectures. If everyone who authored an AGI architecture would explain how their architecture accounts for each of the structures and processes identified in the integrative diagram, this would give a means of relating the various AGI designs to each other.

The integrative diagram could also be used to help connect AGI and cognitive psychology to neuroscience in a more systematic way. In the case of LIDA, a fairly careful correspondence has been drawn up between the LIDA diagram nodes and links and various neural structures and processes [FB08]. Similar knowledge exists for the rest of the integrative diagram, though not organized in such a systematic fashion. A systematic curation of links between the nodes and links in the integrative diagram and current neuroscience knowledge, would constitute an interesting first approximation of the holistic cognitive behavior of the human brain.

Finally (and harking forward to later chapters), the big omission in the integrative diagram is *dynamics*. Structure alone will only get you so far, and you could build an AGI system with reasonable-looking things in each of the integrative diagram's boxes, interrelating according to the given arrows, and yet still fail to make a viable AGI system. Given the limitations the real world places on computing resources, it's not enough to have adequate representations and algorithms in all the boxes, communicating together properly and capable doing the right things given sufficient resources. Rather, one needs to have all the boxes filled in properly with structures and processes that, when they act together using feasible computing resources, will yield appropriately intelligent behaviors via their cooperative activity. And this has to do with the complex interactive dynamics of all the processes in all the different boxes – which is

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something the integrative diagram doesn't touch at all. This brings us again to the network of ideas we've discussed under the name of "cognitive synergy," to be discussed later on.

It might be possible to make something similar to the integrative diagram on the level of dynamics rather than structures, complementing the structural integrative diagram given here; but this would seem significantly more challenging, because we lack a standard set of tools for depicting system dynamics. Most cognitive theorists and AGI architects describe their structural ideas using boxes-and-lines diagrams of some sort, but there is no standard method for depicting complex system dynamics. So to make a dynamical analogue to the integrative diagram, via a similar integrative methodology, one would first need to create appropriate diagrammatic formalizations of the dynamics of the various cognitive theories being integrated – a fascinating but onerous task.

When we first set out to make an integrated cognitive architecture diagram, via combining the complementary insights of various cognitive science and AGI theorists, we weren't sure how well it would work. But now we feel the experiment was generally a success – the resultant integrated architecture seems sensible and coherent, and reasonably complete. It doesn't come close to telling you everything you need to know to understand or implement a human-like mind – but it tells you the various processes and structures you need to deal with, and which of their interrelations are most critical. And, perhaps just as importantly, it gives a concrete way of understanding the insights of a specific but fairly diverse set of cognitive science and AGI theorists as complementary rather than contradictory. In a CogPrime context, it provides a way of tying in the specific structures and dynamics involved in CogPrime, with a more generic portrayal of the structures and dynamics of human-like intelligence.

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Chapter 6
A Brief Overview of CogPrime

6.1 Introduction

Just as there are many different approaches to human flight – airplanes, helicopters, balloons, spacecraft, and doubtless many methods no person has thought of yet – similarly, there are likely many different approaches to advanced artificial general intelligence. All the different approaches to flight exploit the same core principles of aerodynamics in different ways; and similarly, the various different approaches to AGI will exploit the same core principles of general intelligence in different ways.

In the chapters leading up to this one, we have taken a fairly broad view of the project of engineering AGI. We have presented a conception and formal model of intelligence, and described environments, teaching methodologies and cognitive and developmental pathways that we believe are collectively appropriate for the creation of AGI at the human level and ultimately beyond, and with a roughly human-like bias to its intelligence. These ideas stand alone and may be compatible with a variety of approaches to engineering AGI systems. However, they also set the stage for the presentation of CogPrime, the particular AGI design on which we are currently working.

The thorough presentation of the CogPrime design is the job of Part 2 of this book – where, not only are the algorithms and structures involved in CogPrime reviewed in more detailed, but their relationship to the theoretical ideas underlying CogPrime is pursued more deeply. The job of this chapter is a smaller one: to give a high-level overview of some key aspects the CogPrime architecture at a mostly nontechnical level, so as to enable you to approach Part 2 with a little more idea of what to expect. The remainder of Part 1, following this chapter, will present various theoretical notions enabling the particulars, intent and consequences of the CogPrime design to be more thoroughly understood.

6.2 High-Level Architecture of CogPrime

Figures 6.1, 6.2 , 6.4 and 6.5 depict the high-level architecture of CogPrime, which involves the use of multiple cognitive processes associated with multiple types of memory to enable an intelligent agent to execute the procedures that it believes have the best probability of working toward its goals in its current context. In a robot preschool context, for example, the

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top-level goals will be simple things such as pleasing the teacher, learning new information and skills, and protecting the robot's body. Figure 6.3 shows part of the architecture via which cognitive processes interact with each other, via commonly acting on the AtomSpace knowledge repository.

Comparing these diagrams to the integrative human cognitive architecture diagrams given in Chapter 5, one sees the main difference is that the CogPrime diagrams commit to specific structures (e.g. knowledge representations) and processes, whereas the generic integrative architecture diagram refers merely to types of structures and processes. For instance, the integrative diagram refers generally to declarative knowledge and learning, whereas the CogPrime diagram refers to PLN, as a specific system for reasoning and learning about declarative knowledge. Table 6.1 articulates the key connections between the components of the CogPrime diagram and those of the integrative diagram, thus indicating the general cognitive functions instantiated by each of the CogPrime components.

6.3 Current and Prior Applications of OpenCog

Before digging deeper into the theory, and elaborating some of the dynamics underlying the above diagrams, we pause to briefly discuss some of the practicalities of work done with the OpenCog system currently implementing parts of the CogPrime architecture.

OpenCog, the open-source software framework underlying the "OpenCogPrime" (currently partial) implementation of the CogPrime architecture, has been used for commercial applications in the area of natural language processing and data mining; for instance, see [GPPG06] where OpenCogPrime's PLN reasoning and RelEx language processing are combined to do automated biological hypothesis generation based on information gathered from PubMed abstracts. Most relevantly to the present work, it has also been used to control virtual agents in virtual worlds [GEA08].

Prototype work done during 2007-2008 involved using an OpenCog variant called the OpenPetBrain to control virtual dogs in a virtual world (see Figure 6.6 for a screenshot of an OpenPetBrain-controlled virtual dog). While these OpenCog virtual dogs did not display intelligence closely comparable to that of real dogs (or human children), they did demonstrate a variety of interesting and relevant functionalities including:

- learning new behaviors based on imitation and reinforcement
- responding to natural language commands and questions, with appropriate actions and natural language replies
- spontaneous exploration of their world, remembering their experiences and using them to bias future learning and linguistic interaction

One current OpenCog initiative involves extending the virtual dog work via using OpenCog to control virtual agents in a game world inspired by the game Minecraft. These agents are initially specifically concerned with achieving goals in a game world via constructing structures with blocks and carrying out simple English communications. Representative example tasks would be:

- Learning to build steps or ladders to get desired objects that are high up
- Learning to build a shelter to protect itself from aggressors

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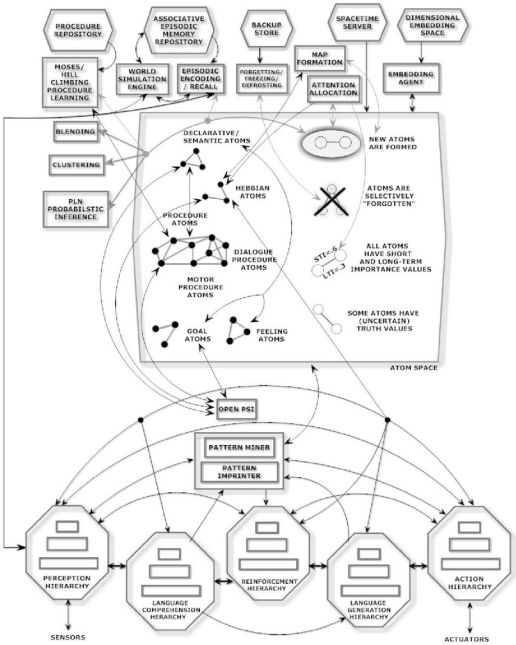

Fig. 6.1: **High-Level Architecture of CogPrime.** This is a conceptual depiction, not a detailed flowchart (which would be too complex for a single image). Figures 6.2 , 6.4 and 6.5 highlight specific aspects of this diagram.

- Learning to build structures resembling structures that it's shown (even if the available materials are a bit different)
- Learning how to build bridges to cross chasms

Of course, the AI significance of learning tasks like this all depends on what kind of feedback the system is given, and how complex its environment is. It would be relatively simple to make an AI system do things like this in a trivial and highly specialized way, but that is not the intent of the project the goal is to have the system learn to carry out tasks like this using general learning mechanisms and a general cognitive architecture, based on embodied experience and

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only scant feedback from human teachers. If successful, this will provide an outstanding platform for ongoing AGI development, as well as a visually appealing and immediately meaningful demo for OpenCog.

Specific, particularly simple tasks that are the focus of this project team's current work at time of writing include:

- Watch another character build steps to reach a high-up object
- Figure out via imitation of this that, in a different context, building steps to reach a high up object may be a good idea
- Also figure out that, if it wants a certain high-up object but there are no materials for building steps available, finding some other way to get elevated will be a good idea that may help it get the object

6.3.1 Transitioning from Virtual Agents to a Physical Robot

Preliminary experiments have also been conducted using OpenCog to control a Nao robot as well as a virtual dog [GdG08]. This involves hybridizing OpenCog with a separate (but interlinked) subsystem handling low-level perception and action. In the experiments done so far, this has been accomplished in an extremely simplistic way. How to do this right is a topic treated in detail in Chapter 26 of Part 2.

We suspect that reasonable level of capability will be achievable by simply interposing DeSTIN (or some other system in its place) as a perception/action "black box" between OpenCog and a robot. Some preliminary experiments in this direction have already been carried out, connecting the OpenPetBrain to a Nao robot using simpler, less capable software than DeSTIN in the intermediary role (off-the-shelf speech-to-text, text-to-speech and visual object recognition software).

However, we also suspect that to achieve robustly intelligent robotics we must go beyond this approach, and connect robot perception and actuation software with OpenCogPrime in a "white box" manner that allows intimate dynamic feedback between perceptual, motoric, cognitive and linguistic functions. We will achieve this via the creation and real-time utilization of links between the nodes in CogPrime's and DeSTIN's internal networks (a topic to be explored in more depth later in this chapter).

6.4 Memory Types and Associated Cognitive Processes in CogPrime

Now we return to the basic description of the CogPrime approach, turning to aspects of the relationship between structure and dynamics. Architecture diagrams are all very well, but, ultimately it is dynamics that makes an architecture come alive. Intelligence is all about learning, which is by definition about change, about dynamical response to the environment and internal self-organizing dynamics.

CogPrime relies on multiple memory types and, as discussed above, is founded on the premise that the right course in architecting a pragmatic, roughly human-like AGI system is to handle different types of memory differently in terms of both structure and dynamics.

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CogPrime's memory types are the declarative, procedural, sensory, and episodic memory types that are widely discussed in cognitive neuroscience [TC05], plus attentional memory for allocating system resources generically, and intentional memory for allocating system resources in a goal-directed way. Table 6.2 overviews these memory types, giving key references and indicating the corresponding cognitive processes, and also indicating which of the generic patternist cognitive dynamics each cognitive process corresponds to (pattern creation, association, etc.). Figure 6.7 illustrates the relationships between several of the key memory types in the context of a simple situation involving an OpenCogPrime-controlled agent in a virtual world.

In terms of patternist cognitive theory, the multiple types of memory in CogPrime should be considered as specialized ways of storing particular types of patterns, optimized for spacetime efficiency. The cognitive processes associated with a certain type of memory deal with creating and recognizing patterns of the type for which the memory is specialized. While in principle all the different sorts of pattern could be handled in a unified memory and processing architecture, the sort of specialization used in CogPrime is necessary in order to achieve acceptable efficient general intelligence using currently available computational resources. And as we have argued in detail in Chapter 7, efficiency is not a side-issue but rather the essence of real-world AGI (since as Hutter has shown, if one casts efficiency aside, arbitrary levels of general intelligence can be achieved via a trivially simple program).

The essence of the CogPrime design lies in the way the structures and processes associated with each type of memory are designed to work together in a closely coupled way, yielding cooperative intelligence going beyond what could be achieved by an architecture merely containing the same structures and processes in separate "black boxes."

The inter-cognitive-process interactions in OpenCog are designed so that

- conversion between different types of memory is possible, though sometimes computationally costly (e.g. an item of declarative knowledge may with some effort be interpreted procedurally or episodically, etc.)
- when a learning process concerned centrally with one type of memory encounters a situation where it learns very slowly, it can often resolve the issue by converting some of the relevant knowledge into a different type of memory: i.e. **cognitive synergy**

6.4.1 Cognitive Synergy in PLN

To put a little meat on the bones of the "cognitive synergy" idea, discussed repeatedly in prior chapters and more extensively in latter chapters, we now elaborate a little on the role it plays in the interaction between procedural and declarative learning.

While MOSES handles much of CogPrime's procedural learning, and CogPrime's internal simulation engine handles most episodic knowledge, CogPrime's primary tool for handling declarative knowledge is an uncertain inference framework called Probabilistic Logic Networks (PLN). The complexities of PLN are the topic of a lengthy technical monograph [GMIH08], and are summarized in Chapter 34; here we will eschew most details and focus mainly on pointing out how PLN seeks to achieve efficient inference control via integration with other cognitive processes.

As a logic, PLN is broadly integrative: it combines certain term logic rules with more standard predicate logic rules, and utilizes both fuzzy truth values and a variant of imprecise probabilities called *indefinite probabilities*. PLN mathematics tells how these uncertain truth values propagate

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through its logic rules, so that uncertain premises give rise to conclusions with reasonably accurately estimated uncertainty values. This careful management of uncertainty is critical for the application of logical inference in the robotics context, where most knowledge is abstracted from experience and is hence highly uncertain.

PLN can be used in either forward or backward chaining mode; and in the language introduced above, it can be used for either analysis or synthesis. As an example, we will consider backward chaining analysis, exemplified by the problem of a robot preschool-student trying to determine whether a new playmate "Bob" is likely to be a regular visitor to is preschool or not (evaluating the truth value of the implication $Bob \rightarrow regular_visitor$). The basic backward chaining process for PLN analysis looks like:

1. Given an implication $L \equiv A \rightarrow B$ whose truth value must be estimated (for instance $L \equiv Concept \wedge Procedure \rightarrow Goal$ as discussed above), create a list $(A_1, ..., A_n)$ of *(inference rule, stored knowledge)* pairs that might be used to produce L
2. Using analogical reasoning to prior inferences, assign each A_i a probability of success
   - If some of the A_i are estimated to have reasonable probability of success at generating reasonably confident estimates of L's truth value, then invoke Step 1 with A_i in place of L (at this point the inference process becomes recursive)
   - If none of the A_i looks sufficiently likely to succeed, then inference has "gotten stuck" and another cognitive process should be invoked, e.g.
     - **Concept creation** may be used to infer new concepts related to A and B, and then Step 1 may be revisited, in the hope of finding a new, more promising A_i involving one of the new concepts
     - **MOSES** may be invoked with one of several special goals, e.g. the goal of finding a procedure P so that $P(X)$ predicts whether $X \rightarrow B$. If MOSES finds such a procedure P then this can be converted to declarative knowledge understandable by PLN and Step 1 may be revisited....
     - **Simulations** may be run in CogPrime's internal simulation engine, so as to observe the truth value of $A \rightarrow B$ in the simulations; and then Step 1 may be revisited....

The combinatorial explosion of inference control is combatted by the capability to defer to other cognitive processes when the inference control procedure is unable to make a sufficiently confident choice of which inference steps to take next. Note that just as MOSES may rely on PLN to model its evolving populations of procedures, PLN may rely on MOSES to create complex knowledge about the terms in its logical implications. This is just one example of the multiple ways in which the different cognitive processes in CogPrime interact synergetically; a more thorough treatment of these interactions is given in [Goe09a].

In the "new playmate" example, the interesting case is where the robot initially seems not to know enough about Bob to make a solid inferential judgment (so that none of the A_i seem particularly promising). For instance, it might carry out a number of possible inferences and not come to any reasonably confident conclusion, so that the reason none of the A_i seem promising is that all the decent-looking ones have been tried already. So it might then recourse to MOSES, simulation or concept creation.

For instance, the PLN controller could make a list of everyone who has been a regular visitor, and everyone who has not been, and pose MOSES the task of figuring out a procedure for distinguishing these two categories. This procedure could then be used directly to make the needed assessment, or else be translated into logical rules to be used within PLN inference. For

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example, perhaps MOSES would discover that older males wearing ties tend not to become regular visitors. If the new playmate is an older male wearing a tie, this is directly applicable. But if the current playmate is wearing a tuxedo, then PLN may be helpful via reasoning that even though a tuxedo is not a tie, it's a similar form of fancy dress – so PLN may extend the MOSES-learned rule to the present case and infer that the new playmate is not likely to be a regular visitor.

6.5 Goal-Oriented Dynamics in CogPrime

CogPrime's dynamics has both goal-oriented and "spontaneous" aspects; here for simplicity's sake we will focus on the goal-oriented ones. The basic goal-oriented dynamic of the CogPrime system, within which the various types of memory are utilized, is driven by implications known as "cognitive schematics", which take the form

$$Context \wedge Procedure \rightarrow Goal < p >$$

(summarized $C \wedge P \rightarrow G$). Semi-formally, this implication may be interpreted to mean: "If the context C appears to hold currently, then if I enact the procedure P, I can expect to achieve the goal G with certainty p." Cognitive synergy means that the learning processes corresponding to the different types of memory actively cooperate in figuring out what procedures will achieve the system's goals in the relevant contexts within its environment.

CogPrime's cognitive schematic is significantly similar to production rules in classical architectures like SOAR and ACT-R (as reviewed in Chapter 4; however, there are significant differences which are important to CogPrime's functionality. Unlike with classical production rules systems, uncertainty is core to CogPrime's knowledge representation, and each CogPrime cognitive schematic is labeled with an uncertain truth value, which is critical to its utilization by CogPrime's cognitive processes. Also, in CogPrime, cognitive schematics may be incomplete, missing one or two of the terms, which may then be filled in by various cognitive processes (generally in an uncertain way). A stronger similarity is to MicroPsi's triplets; the differences in this case are more low-level and technical and have already been mentioned in Chapter 4.

Finally, the biggest difference between CogPrime's cognitive schematics and production rules or other similar constructs, is that in CogPrime this level of knowledge representation is not the only important one. CLARION [SZ04], as reviewed above, is an example of a cognitive architecture that uses production rules for explicit knowledge representation and then uses a totally separate subsymbolic knowledge store for implicit knowledge. In CogPrime

both explicit and implicit knowledge are stored in the same graph of nodes and links, with

- explicit knowledge stored in probabilistic logic based nodes and links such as cognitive schematics (see Figure 6.8 for a depiction of some explicit linguistic knowledge.)
- implicit knowledge stored in patterns of activity among these same nodes and links, defined via the activity of the "importance" values (see Figure 6.9 for an illustrative example thereof) associated with nodes and links and propagated by the ECAN attention allocation process

The meaning of a cognitive schematic in CogPrime is hence not entirely encapsulated in its explicit logical form, but resides largely in the activity patterns that ECAN causes its activation or exploration to give rise to. And this fact is important because the synergetic interactions of system components are in large part modulated by ECAN activity. Without the real-time

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combination of explicit and implicit knowledge in the system's knowledge graph, the synergetic interaction of different cognitive processes would not work so smoothly, and the emergence of effective high-level hierarchical, heterarchical and self structures would be less likely.

6.6 Analysis and Synthesis Processes in CogPrime

We now return to CogPrime's fundamental cognitive dynamics, using examples from the "virtual dog" application to motivate the discussion.

The cognitive schematic $Context \wedge Procedure \rightarrow Goal$ leads to a conceptualization of the internal action of an intelligent system as involving two key categories of learning:

- **Analysis**: Estimating the probability p of a posited $C \wedge P \rightarrow G$ relationship
- **Synthesis**: Filling in one or two of the variables in the cognitive schematic, given assumptions regarding the remaining variables, and directed by the goal of maximizing the probability of the cognitive schematic

More specifically, where synthesis is concerned,

- The MOSES probabilistic evolutionary program learning algorithm is applied to find P, given fixed C and G. Internal simulation is also used, for the purpose of creating a simulation embodying C and seeing which P lead to the simulated achievement of G.
  - *Example: A virtual dog learns a procedure P to please its owner (the goal G) in the context C where there is a ball or stick present and the owner is saying "fetch".*
- PLN inference, acting on declarative knowledge, is used for choosing C, given fixed P and G (also incorporating sensory and episodic knowledge as appropriate). Simulation may also be used for this purpose.
  - *Example: A virtual dog wants to achieve the goal G of getting food, and it knows that the procedure P of begging has been successful at this before, so it seeks a context C where begging can be expected to get it food. Probably this will be a context involving a friendly person.*
- PLN-based goal refinement is used to create new subgoals G to sit on the right hand side of instances of the cognitive schematic.
  - *Example: Given that a virtual dog has a goal of finding food, it may learn a subgoal of following other dogs, due to observing that other dogs are often heading toward their food.*
- Concept formation heuristics are used for choosing G and for fueling goal refinement, but especially for choosing C (via providing new candidates for C). They are also used for choosing P, via a process called "predicate schematization" that turns logical predicates (declarative knowledge) into procedures.
  - *Example: At first a virtual dog may have a hard time predicting which other dogs are going to be mean to it. But it may eventually observe common features among a number of mean dogs, and thus form its own concept of "pit bull," without anyone ever teaching it this concept explicitly.*

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Where analysis is concerned:

- PLN inference, acting on declarative knowledge, is used for estimating the probability of the implication in the cognitive schematic, given fixed C, P and G. Episodic knowledge is also used in this regard, via enabling estimation of the probability via simple similarity matching against past experience. Simulation is also used: multiple simulations may be run, and statistics may be captured therefrom.
  - *Example: To estimate the degree to which asking Bob for food (the procedure P is "asking for food", the context C is "being with Bob") will achieve the goal G of getting food, the virtual dog may study its memory to see what happened on previous occasions where it or other dogs asked Bob for food or other things, and then integrate the evidence from these occasions.*
- Procedural knowledge, mapped into declarative knowledge and then acted on by PLN inference, can be useful for estimating the probability of the implication $C \wedge P \rightarrow G$, in cases where the probability of $C \wedge P_1 \rightarrow G$ is known for some P_1 related to P.
  - *Example: knowledge of the internal similarity between the procedure of asking for food and the procedure of asking for toys, allows the virtual dog to reason that if asking Bob for toys has been successful, maybe asking Bob for food will be successful too.*
- Inference, acting on declarative or sensory knowledge, can be useful for estimating the probability of the implication $C \wedge P \rightarrow G$, in cases where the probability of $C_1 \wedge P \rightarrow G$ is known for some C_1 related to C.
  - *Example: if Bob and Jim have a lot of features in common, and Bob often responds positively when asked for food, then maybe Jim will too.*
- Inference can be used similarly for estimating the probability of the implication $C \wedge P \rightarrow G$, in cases where the probability of $C \wedge P \rightarrow G_1$ is known for some G_1 related to G. Concept creation can be useful indirectly in calculating these probability estimates, via providing new concepts that can be used to make useful inference trails more compact and hence easier to construct.
  - *Example: The dog may reason that because Jack likes to play, and Jack and Jill are both children, maybe Jill likes to play too. It can carry out this reasoning only if its concept creation process has invented the concept of "child" via analysis of observed data.*

In these examples we have focused on cases where two terms in the cognitive schematic are fixed and the third must be filled in; but just as often, the situation is that only one of the terms is fixed. For instance, if we fix G, sometimes the best approach will be to collectively learn C and P. This requires either a procedure learning method that works interactively with a declarative-knowledge-focused concept learning or reasoning method; or a declarative learning method that works interactively with a procedure learning method. That is, it requires the sort of cognitive synergy built into the CogPrime design.

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6.7 Conclusion

To thoroughly describe a comprehensive, integrative AGI architecture in a brief chapter would be an impossible task; all we have attempted here is a brief overview, to be elaborated on in the 800-odd pages of Part 2 of this book. We do not expect this brief summary to be enough to convince the skeptical reader that the approach described here has a reasonable odds of success at achieving its stated goals, or even of fulfilling the conceptual notions outlined in the preceding chapters. However, we hope to have given the reader at least a rough idea of *what sort of AGI design* we are advocating, and *why and in what sense we believe it can lead to advanced artificial general intelligence*. For more details on the structure, dynamics and underlying concepts of CogPrime, the reader is encouraged to proceed to Part 2– after completing Part 1, of course. Please be patient – building a thinking machine is a big topic, and we have a lot to say about it!

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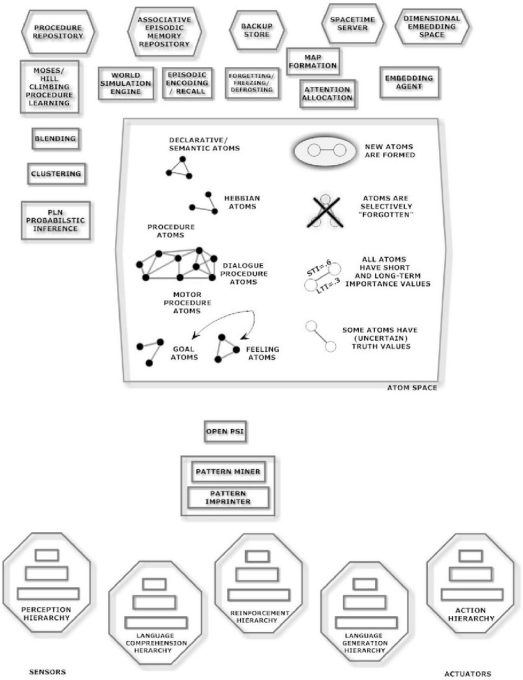

Fig. 6.2: **Key Explicitly Implemented Processes of CogPrime** . The large box at the center is the Atomspace, the system's central store of various forms of (long-term and working) memory, which contains a weighted labeled hypergraph whose nodes and links are "Atoms" of various sorts. The hexagonal boxes at the bottom denote various hierarchies devoted to recognition and generation of patterns: perception, action and linguistic. Intervening between these recognition/generation hierarchies and the Atomspace, we have a pattern mining/imprinting component (that recognizes patterns in the hierarchies and passes them to the Atomspace; and imprints patterns from the Atomspace on the hierarchies); and also OpenPsi, a special dynamical framework for choosing actions based on motivations. Above the Atomspace we have a host of cognitive processes, which act on the Atomspace, some continually and some only as context dictates, carrying out various sorts of learning and reasoning (pertinent to various sorts of memory) that help the system fulfill its goals and motivations.

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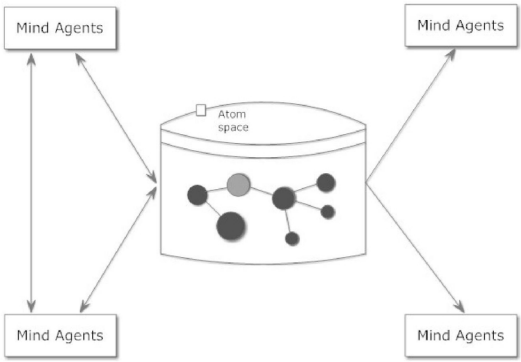

Fig. 6.3: **MindAgents and AtomSpace in OpenCog.** This is a conceptual depiction of one way cognitive processes may interact in OpenCog – they may be wrapped in MindAgent objects, which interact via cooperatively acting on the AtomSpace.

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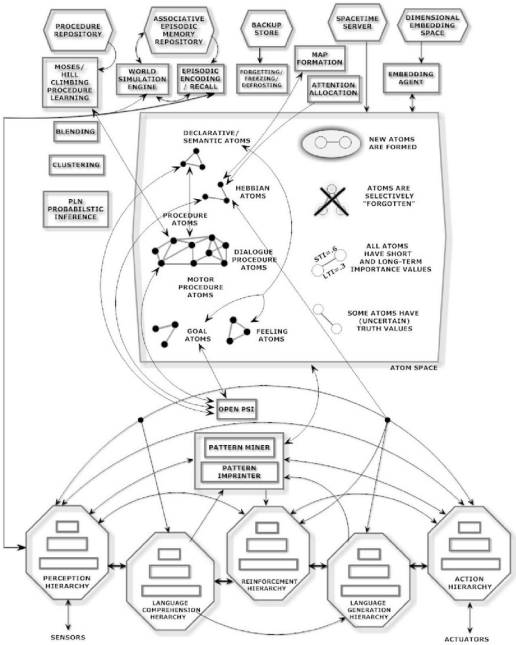

Fig. 6.4: **Links Between Cognitive Processes and the Atomspace**. The cognitive processes depicted all act on the Atomspace, in the sense that they operate by observing certain Atoms in the Atomspace and then modifying (or in rare cases deleting) them, and potentially adding new Atoms as well. Atoms represent all forms of knowledge, but some forms of knowledge are additionally represented by external data stores connected to the Atomspace, such as the Procedure Repository; these are also shown as linked to the Atomspace.

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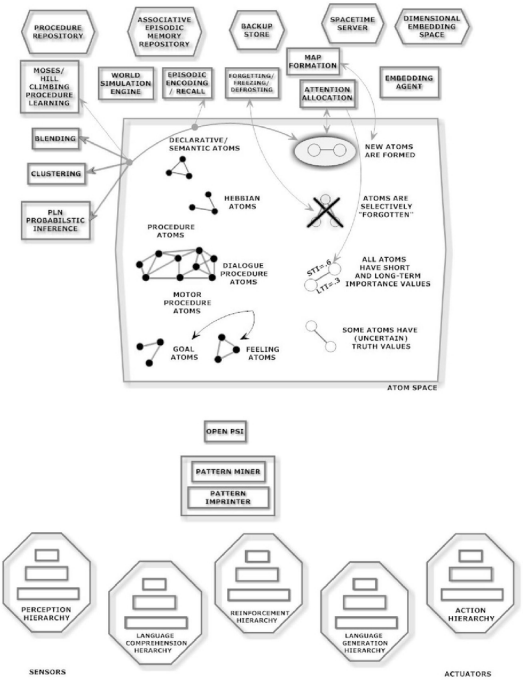

Fig. 6.5: **Invocation of Atom Operations By Cognitive Processes**. This diagram depicts some of the Atom modification, creation and deletion operations carried out by the abstract cognitive processes in the CogPrime architecture.

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CogPrime Component	Int. Diag. Sub-Diagram	Int. Diag. Component
Procedure Repository	Long-Term Memory	Procedural
Procedure Repository	Working Memory	Active Procedural
Associative Episodic Memory	Long-Term Memory	Episodic
Associative Episodic Memory	Working Memory	Transient Episodic
Backup Store	Long-Term Memory	*no correlate: a function not necessarily possessed by the human mind*
Spacetime Server	Long-Term Memory	Declarative and Sensorimotor
Dimensional Embedding Space	*no clear correlate: a tool for helping multiple types of LTM*	
Dimensional Embedding Agent	*no clear correlate*	
Blending	Long-Term and Working Memory	Concept Formation
Clustering	Long-Term and Working Memory	Concept Formation
PLN Probabilistic Inference	Long-Term and Working Memory	Reasoning and Plan Learning/Optimization
MOSES / Hillclimbing	Long-Term and Working Memory	Procedure Learning
World Simulation	Long-Term and Working Memory	Simulation
Episodic Encoding / Recall	Long-Term g Memory	Story-telling
Episodic Encoding / Recall	Working Memory	Consolidation
Forgetting / Freezing / Defrosting	Long-Term and Working Memory	*no correlate: a function not necessarily possessed by the human mind*
Map Formation	Long-Term Memory	Concept Formation and Pattern Mining
Attention Allocation	Long-Term and Working Memory	Hebbian/Attentional Learning
Attention Allocation	High-Level Mind Architecture	Reinforcement
Attention Allocation	Working Memory	Perceptual Associative Memory and Local Association
AtomSpace	High-Level Mind Architecture	*no clear correlate: a general tool for representing memory including long-term and working, plus some of perception and action*
AtomSpace	Working Memory	Global Workspace (the high-STI portion of AtomSpace) & other Workspaces
Declarative Atoms	Long-Term and Working Memory	Declarative and Sensorimotor
Procedure Atoms	Long-Term and Working Memory	Procedural
Hebbian Atoms	Long-Term and Working Memory	Attentional
Goal Atoms	Long-Term and Working Memory	Intentional
Feeling Atoms	Long-Term and Working Memory	spanning Declarative, Intentional and Sensorimotor
OpenPsi	High-Level Mind Architecture	Motivation / Action Selection
OpenPsi	Working Memory	Action Selection
Pattern Miner	High-Level Mind Architecture	arrows between perception and working and long-term memory
Pattern Miner	Working Memory	arrows between sensory memory and perceptual associative and transient episodic memory
		arrows between action selection and

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Fig. 6.6: Screenshot of OpenCog-controlled virtual dog

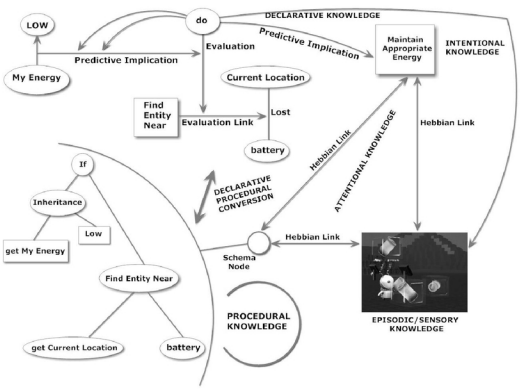

Fig. 6.7: **Relationship Between Multiple Memory Types**. The bottom left corner shows a program tree, constituting procedural knowledge. The upper left shows declarative nodes and links in the Atomspace. The upper right corner shows a relevant system goal. The lower right corner contains an image symbolizing relevant episodic and sensory knowledge. All the various types of knowledge link to each other and can be approximatively converted to each other.

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Memory Type	Specific Cognitive Processes	General Cognitive Functions
Declarative	Probabilistic Logic Networks (PLN) [GMIH08]; conceptual blending [FT02]	pattern creation
Procedural	MOSES (a novel probabilistic evolutionary program learning algorithm) [Loo06]	pattern creation
Episodic	internal simulation engine [GEA08]	association, pattern creation
Attentional	Economic Attention Networks (ECAN) [GPI+10]	association, credit assignment
Intentional	probabilistic goal hierarchy refined by PLN and ECAN, structured according to MicroPsi [Bac09]	credit assignment, pattern creation
Sensory	In CogBot, this will be supplied by the DeSTIN component	association, attention allocation, pattern creation, credit assignment

Table 6.2: Memory Types and Cognitive Processes in CogPrime. The third column indicates the general cognitive function that each specific cognitive process carries out, according to the patternist theory of cognition.

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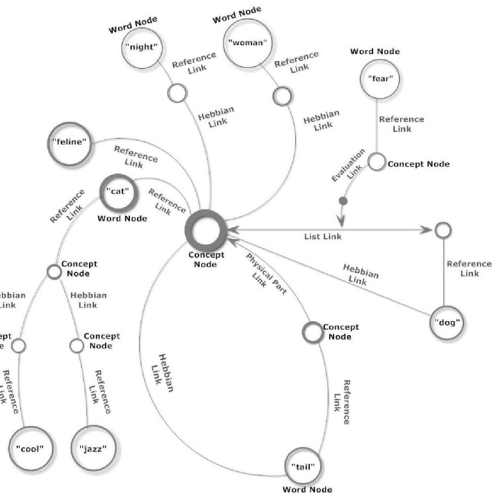

Fig. 6.8: **Example of Explicit Knowledge in the Atomspace**. One simple example of explicitly represented knowledge in the Atomspace is linguistic knowledge, such as words and the concepts directly linked to them. Not all of a CogPrime system's concepts correlate to words, but some do.

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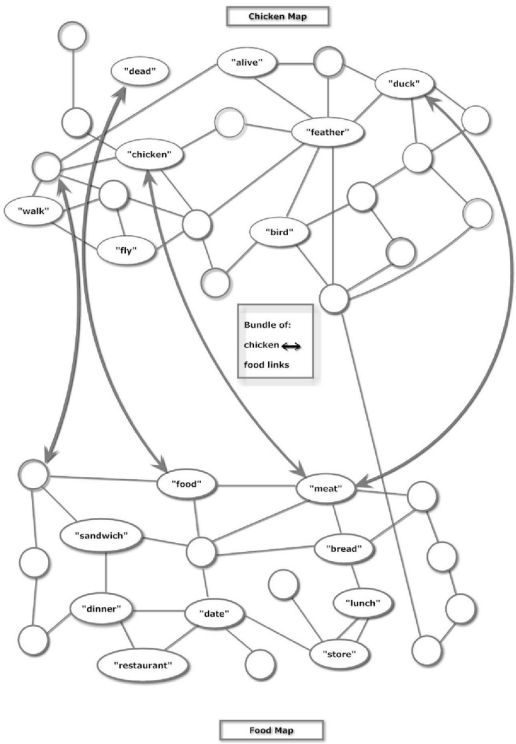

Fig. 6.9: **Example of Implicit Knowledge in the Atomspace**. A simple example of implicit knowledge in the Atomspace. The "chicken" and "food" concepts are represented by "maps" of ConceptNodes interconnected by HebbianLinks, where the latter tend to form between ConceptNodes that are often simultaneously important. The bundle of links between nodes in the chicken map and nodes in the food map, represents an "implicit, emergent link" between the two concept maps. This diagram also illustrates "glocal" knowledge representation, in that the chicken and food concepts are each represented by individual nodes, but also by distributed maps. The "chicken" ConceptNode, when important, will tend to make the rest of the map important – and vice versa. Part of the overall chicken concept possessed by the system is expressed by the explicit links coming out of the chicken ConceptNode, and part is represented only by the distributed chicken map as a whole.

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Section II
Toward a General Theory of General Intelligence

Chapter 7
A Formal Model of Intelligent Agents

7.1 Introduction

The artificial intelligence field is full of sophisticated mathematical models and equations, but most of these are highly specialized in nature – e.g. formalizations of particular logic systems, analyzes of the dynamics of specific sorts of neural nets, etc. On the other hand, a number of highly general models of intelligent systems also exist, including Hutter's recent formalization of universal intelligence [Hut05] and a large body of work in the disciplines of systems science and cybernetics – but these have tended not to yield many specific lessons useful for engineering AGI systems, serving more as conceptual models in mathematical form.

It would be fantastic to have a mathematical theory bridging these extremes – a real "general theory of general intelligence," allowing the derivation and analysis of specific structures and processes playing a role in practical AGI systems, from broad mathematical models of general intelligence in various situations and under various constraints. However, the path to such a theory is not entirely clear at present; and, as valuable as such a theory would be, we don't believe such a thing to be *necessary* for creating advanced AGI. One possibility is that the development of such a theory will occur contemporaneously and synergetically with the advent of practical AGI technology.

Lacking a mature, pragmatically useful "general theory of general intelligence," however, we have still found it valuable to articulate certain theoretical ideas about the nature of general intelligence, with a level of rigor a bit greater than the wholly informal discussions of the previous chapters. The chapters in this section of the book articulate some ideas we have developed in pursuit of a general theory of general intelligence; ideas that, even in their current relatively undeveloped form, have been very helpful in guiding our concrete work on the CogPrime design.

This chapter presents a more formal version of the notion of intelligence as "achieving complex goals in complex environments," based on a formal model of intelligent agents. These formalizations of agents and intelligence will be used in later chapters as a foundation for formalizing other concepts like inference and cognitive synergy. Chapters 8 and 9 pursue the notion of cognitive synergy a little more thoroughly than was done in previous chapters. Chapter 10 sketches a general theory of general intelligence using tools from category theory – not bringing it to the level where one can use it to derive specific AGI algorithms and structures; but still, presenting ideas that will be helpful in interpreting and explaining specific aspects of the CogPrime design in Part 2. Finally, Appendix **??** explores an additional theoretical direction, in which the mind of an intelligent system is viewed in terms of certain curved spaces – a novel way of thinking

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about the dynamics of general intelligence, which has been useful in guiding development of the ECAN component of CogPrime, and we expect will have more general value in future.

Despite the intermittent use of mathematical formalism, the ideas presented in this section are fairly speculative, and we do not propose them as constituting a well-demonstrated theory of general intelligence. Rather, we propose them as an interesting *way of thinking* about general intelligence, which appears to be consistent with available data, and which has proved inspirational to us in conceiving concrete structures and dynamics for AGI, as manifested for example in the CogPrime design. Understanding the way of thinking described in these chapters is valuable for understanding why the CogPrime design is the way it is, and for relating CogPrime to other practical and intellectual systems, and extending and improving CogPrime.

7.2 A Simple Formal Agents Model (SRAM)

We now present a formalization of the concept of "intelligent agents" – beginning with a formalization of "agents" in general.

Drawing on [Hut05, LH07a], we consider a class of active agents which observe and explore their environment and also take actions in it, which may affect the environment. Formally, the agent sends information to the environment by sending symbols from some finite alphabet called the *action space* Σ; and the environment sends signals to the agent with symbols from an alphabet called the *perception space*, denoted $\mathcal{P}$. Agents can also experience rewards, which lie in the *reward space*, denoted $\mathcal{R}$, which for each agent is a subset of the rational unit interval.

The agent and environment are understood to take turns sending signals back and forth, yielding a history of actions, observations and rewards, which may be denoted

$$a_1 o_1 r_1 a_2 o_2 r_2 ...$$

or else

$$a_1 x_1 a_2 x_2 ...$$

if x is introduced as a single symbol to denote both an observation and a reward. The complete interaction history up to and including cycle t is denoted $ax_{1:t}$; and the history before cycle t is denoted $ax_{<t} = ax_{1:t-1}$.

The agent is represented as a function π which takes the current history as input, and produces an action as output. Agents need not be deterministic, an agent may for instance induce a probability distribution over the space of possible actions, conditioned on the current history. In this case we may characterize the agent by a probability distribution $\pi(a_t|ax_{<t})$. Similarly, the environment may be characterized by a probability distribution $\mu(x_k|ax_{<k}a_k)$. Taken together, the distributions π and μ define a probability measure over the space of interaction sequences.

Next, we extend this model in a few ways, intended to make it better reflect the realities of intelligent computational agents. The first modification is to allow agents to maintain memories (of finite size), via adding memory actions drawn from a set $\mathcal{M}$ into the history of actions, observations and rewards. The second modification is to introduce the notion of **goals**.

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7.2.1 Goals

We define goals as mathematical functions (to be specified below) associated with symbols drawn from the alphabet $\mathcal{G}$; and we consider the environment as sending goal-symbols to the agent along with regular observation-symbols. (Note however that the presentation of a goal-symbol to an agent does not necessarily entail the explicit communication to the agent of the contents of the goal function. This must be provided by other, correlated observations.) We also introduce a conditional distribution $\gamma(g, \mu)$ that gives the weight of a goal g in the context of a particular environment μ.

In this extended framework, an interaction sequence looks like

$$a_1 o_1 g_1 r_1 a_2 o_2 g_2 r_2 ...$$

or else

$$a_1 y_1 a_2 y_2 ...$$

where g_i are symbols corresponding to goals, and y is introduced as a single symbol to denote the combination of an observation, a reward and a goal.

Each goal function maps each finite interaction sequence $I_{g,s,t} = ay_{s:t}$ with g_s to g_t corresponding to g, into a value $r_g(I_{g,s,t}) \in [0, 1]$ indicating the value or "raw reward" of achieving the goal during that interaction sequence. The total reward r_t obtained by the agent is the sum of the raw rewards obtained at time t from all goals whose symbols occur in the agent's history before t.

This formalism of goal-seeking agents allows us to formalize the notion of intelligence as "achieving complex goals in complex environments" – a direction that is pursued in Section 7.3 below.

Note that this is an *external* perspective of system goals, which is natural from the perspective of formally defining system intelligence in terms of system behavior, but is not necessarily very natural in terms of system design. From the point of view of AGI design, one is generally more concerned with the (implicit or explicit) representation of goals inside an AGI system, as in CogPrime's Goal Atoms to be reviewed in Chapter 22 below.

Further, it is important to also consider the case where an AGI system has no explicit goals, and the system's environment has no immediately identifiable goals either. But in this case, we don't see any clear way to define a system's intelligence, except via *approximating* the system in terms of other theoretical systems which do have explicit goals. This approximation approach is developed in Section 7.3.5 below.

The awkwardness of linking the general formalism of intelligence theory presented here, with the practical business of creating and designing AGI systems, may indicate a shortcoming on the part of contemporary intelligence theory or AGI designs. On the other hand, this sort of situation often occurs in other domains as well – e.g. the leap from quantum theory to the analysis of real-world systems like organic molecules involves a lot of awkwardness and large leaps a well.

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7.2.2 Memory Stores

As well as goals, we introduce into the model a long-term memory and a workspace. Regarding long-term memory we assume the agent's memory consists of multiple memory stores corresponding to various types of memory, e.g.: procedural (K_{Proc}), declarative (K_{Dec}), episodic (K_{Ep}), attentional (K_{Att}) and Intentional (K_{Int}). In Appendix **??** a category-theoretic model of these memory stores is introduced; but for the moment, we need only assume the existence of

- an injective mapping $\Theta_{Ep} : K_{Ep} \to \mathcal{H}$ where $\mathcal{H}$ is the space of fuzzy sets of subhistories (subhistories being "episodes" in this formalism)
- an injective mapping $\Theta_{Proc} : K_{Proc} \times \mathcal{M} \times \mathcal{W} \to \mathcal{A}$, where $\mathcal{M}$ is the set of memory states, $\mathcal{W}$ is the set of (observation, goal, reward) triples, and $\mathcal{A}$ is the set of actions (this maps each procedure object into a function that enacts actions in the environment or memory, based on the memory state and current world-state)
- an injective mapping $\Theta_{Dec} : K_{Dec} \to \mathcal{L}$, where $\mathcal{L}$ is the set of expressions in some formal language (which may for example be a logical language), which possesses words corresponding to the observations, goals, reward values and actions in our agent formalism
- an injective mapping $\Theta_{Int} : K_{Int} \to \mathcal{G}$, where $\mathcal{G}$ is the space of goals mentioned above
- an injective mapping $\Theta_{Att} : K_{Int} \cup K_{Ep} \cup K_{Proc} \cup K_{Ec} \to \mathcal{V}$, where $\mathcal{V}$ is the space of "attention values" (structures that gauge the importance of paying attention to an item of knowledge over various time-scales or in various contexts)

We also assume that the vocabulary of actions contains memory-actions corresponding to the operations of inserting the current observation, goal, reward or action into the episodic and/or declarative memory store. And, we assume that the activity of the agent, at each time-step, includes the enaction of one or more of the procedures in the procedural memory store. If several procedures are enacted at once, then the end result is still formally modeled as a single action $a = a_{[1]} * ... * a_{[k]}$ where $*$ is an operator on action-space that composes multiple actions into a single one.

Finally, we assume that, at each time-step, the agent may carry out an external action a_i on the environment, a memory action m_i on the (long-term) memory, and an action b_i on its **internal workspace**. Among the actions that can be carried out on the workspace, are the ability to insert or delete observations, goals, actions or reward-values from the workspace. The workspace can be thought of as a sort of short-term memory or else in terms of Baars' "global workspace" concept mentioned above. The workspace provides a medium for interaction between the different memory types.

The workspace provides a mechanism by which declarative, episodic and procedural memory may interact with each other. For this mechanism to work, we must assume that there are actions corresponding to query operations that allow procedures to look into declarative and episodic memory. The nature of these query operations will vary among different agents, but we can assume that in general an agent has

- one or more procedures $Q_{Dec}(x)$ serving as *declarative queries*, meaning that when Q_{Dec} is enacted on some x that is an ordered set of items in the workspace, the result is that one or more items from declarative memory is entered into the workspace
- one or more procedures $Q_{Ep}(x)$ serving as *episodic queries*, meaning that when Q_{Ep} is enacted on some x that is an ordered set of items in the workspace, the result is that one or more items from episodic memory is entered into the workspace

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One additional aspect of CogPrime's knowledge representation that is important to PLN is the attachment of nonnegative weights n_i corresponding to elementary observations o_i. These weights denote the amount of evidence contained in the observation. For instance, in the context of a robotic agent, one could use these values to encode the assumption that an elementary visual observation has more evidential value than an elementary olfactory observation.

We now have a model of an agent with long-term memory comprising procedural, declarative and episodic aspects, an internal cognitive workspace, and the capability to use procedures to drive actions based on items in memory and the workspace, and to move items between long-term memory and the workspace.

7.2.2.1 Modeling CogPrime

Of course, this formal model may be realized differently in various real-world AGI systems. In CogPrime we have

- a weighted, labeled hypergraph structure called the AtomSpace used to store declarative knowledge (this is the representation used by PLN)
- a collection of programs in a LISP-like language called Combo, stored in a ProcedureRepository data structure, used to store procedural knowledge
- a collection of partial "movies" of the system's experience, played back using an internal simulation engine, used to store episodic knowledge
- AttentionValue objects, minimally containing ShortTermImportance (STI) and LongTermImportance (LTI) values used to store attentional knowledge
- Goal Atoms for intentional knowledge, stored in the same format as declarative knowledge but whose dynamics involve a special form of artificial currency that is used to govern action selection

The AtomSpace is the central repository and procedures and episodes are linked to Atoms in the AtomSpace which serve as their symbolic representatives. The "workspace" in CogPrime exists only virtually: each item in the AtomSpace has a "short term importance" (STI) level, and the workspace consists of those items in the AtomSpace with highest STI, and those procedures and episodes whose symbolic representatives in the AtomSpace have highest STI.

On the other hand, as we saw above, the LIDA architecture uses separate representations for procedural, declarative and episodic memory, but also has an explicit workspace component, where the most currently contextually relevant items from all different types of memory are gathered and used together in the course of actions. However, compared to CogPrime, it lacks comparably fine-grained methods for integrating the different types of memory.

Systematically mapping various existing cognitive architectures, or human brain structure, into this formal agents model would be a substantial though quite plausible exercise; but we will not undertake this here.

7.2.3 The Cognitive Schematic

Next we introduce an additional specialization into SRAM: the **cognitive schematic**, written informally as

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$$Context \ \& \ Procedure \rightarrow Goal$$

and considered more formally as $holds(C) \ \& \ ex(P) \rightarrow h_i$ where h may be an externally specified goal g_i or an internally specified goal h derived as a (possibly uncertain) subgoal of one of more g_i; C is a piece of declarative or episodic knowledge and P is a procedure that the agent can internally execute to generate a series of actions. $ex(P)$ is the proposition that P is successfully executed. If C is episodic then $holds(C)$ may be interpreted as the current context (i.e. some finite slice of the agent's history) being similar to C; if C is declarative then $holds(C)$ may be interpreted as the truth value of C evaluated at the current context. Note that C may refer to some part of the world quite distant from the agent's current sensory observations; but it may still be formally evaluated based on the agent's history.

In the standard CogPrime notation as introduced formally in Chapter 20 (where indentation has function-argument syntax similar to that in Python, and relationship types are prepended to their relata without parentheses), for the case C is declarative this would be written as

```
PredictiveExtensionalImplication
    AND
        C
        Execution P
    G
```

and in the case C is episodic one replaces C in this formula with a predicate expressing C's similarity to the current context. The semantics of the PredictiveExtensionalInheritance relation will be discussed below. The Execution relation simply denotes the proposition that procedure P has been executed.

For the class of SRAM agents who (like CogPrime) use the cognitive schematic to govern many or all of their actions, a significant fragment of agent intelligence boils down to estimating the truth values of PredictiveExtensionalImplication relationships. Action selection procedures can be used, which choose procedures to enact based on which ones are judged most likely to achieve the current external goals g_i in the current context. Rather than enter into the particularities of action selection or other cognitive architecture issues, we will restrict ourselves to PLN inference, which in the context of the present agent model is a method for handling PredictiveImplication in the cognitive schematic.

Consider an agent in a virtual world, such as a virtual dog, one of whose external goals is to please its owner. Suppose its owner has asked it to find a cat, and it can translate this into a subgoal "find cat." If the agent operates according to the cognitive schematic, it will search for P so that

```
PredictiveExtensionalImplication
    AND
        C
        Execution P
    Evaluation
        found
        cat
```

holds.

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7.3 Toward a Formal Characterization of Real-World General Intelligence

Having defined what we mean by an agent acting in an environment, we now turn to the question of what it means for such an agent to be "intelligent."

As we have reviewed extensively in Chapter 2 above, "intelligence" is a commonsense, "folk psychology" concept, with all the imprecision and contextuality that this generally entails. One cannot expect any compact, elegant formalism to capture all of its meanings. Even in the psychology and AI research communities, divergent definitions abound; Legg and Hutter [LH07a] lists and organizes 70+ definitions from the literature.

Practical study of natural intelligence in humans and other organisms, and practical design, creation and instruction of artificial intelligences, can proceed perfectly well without an agreed-upon formalization of the "intelligence" concept. Some researchers may conceive their own formalisms to guide their own work, others may feel no need for any such thing.

But nevertheless, it is of interest to seek formalizations of the concept of intelligence, which capture useful fragments of the commonsense notion of intelligence, and provide guidance for practical research in cognitive science and AI. A number of such formalizations have been given in recent decades, with varying degrees of mathematical rigor. Perhaps the most carefully-wrought formalization of intelligence so far is the theory of "universal intelligence" presented by Shane Legg and Marcus Hutter in [LH07b], which draws on ideas from algorithmic information theory.

Universal intelligence captures a certain aspect of the "intelligence" concept very well, and has the advantage of connecting closely with ideas in learning theory, decision theory and computation theory. However, the kind of general intelligence it captures best, is a kind which is in a sense *more general* in scope than human-style general intelligence. Universal intelligence does capture the sense in which humans are more intelligent than worms, which are more intelligent than rocks; and the sense in which theoretical AGI systems like Hutter's AIXI or $AIXI^{tl}$ [Hut05] would be much more intelligent than humans. But it misses essential aspects of the intelligence concept as it is used in the context of intelligent natural systems like humans or real-world AI systems.

Our main goal in this section is to present variants of universal intelligence that better capture the notion of intelligence as it is typically understood in the context of real-world natural and artificial systems. The first variant we describe is *pragmatic general intelligence*, which is inspired by the intuitive notion of intelligence as "the ability to achieve complex goals in complex environments," given in [Goe93a]. After assuming a prior distribution over the space of possible environments, and one over the space of possible goals, one then defines the pragmatic general intelligence as the expected level of goal-achievement of a system relative to these distributions. Rather than measuring truly broad mathematical general intelligence, pragmatic general intelligence measures intelligence in a way that's specifically biased toward certain environments and goals.

Another variant definition is then presented, the *efficient pragmatic general intelligence*, which takes into account the amount of computational resources utilized by the system in achieving its intelligence. Some argue that making efficient use of available resources is a defining characteristic of intelligence, see e.g. [Wan06].

A critical question left open is the characterization of the prior distributions corresponding to everyday human reality; we give a semi-formal sketch of some ideas on this in Chapter 9 below, where we present the notion of a "communication prior," which assigns a probability

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weight to a situation S based on the ease with which one agent in a society can communicate S to another agent in that society, using multimodal communication (including verbalization, demonstration, dramatic and pictorial depiction, etc.).

Finally, we present a formal measure of the "generality" of an intelligence, which precisiates the informal distinction between "general AI" and "narrow AI."

7.3.1 Biased Universal Intelligence

To define universal intelligence, Legg and Hutter consider the class of environments that are *reward-summable*, meaning that the total amount of reward they return to any agent is bounded by 1. Where r_i denotes the reward experienced by the agent from the environment at time i, the *expected total reward* for the agent π from the environment μ is defined as

$$V_\mu^\pi \equiv E(\sum_1^\infty r_i) \leq 1$$

To extend their definition in the direction of greater realism, we first introduce a second-order probability distribution ν, which is a probability distribution over the space of environments μ. The distribution ν assigns each environment a probability. One such distribution ν is the Solomonoff-Levin universal distribution in which one sets $\nu = 2^{-K(\mu)}$; but this is not the only distribution ν of interest. In fact a great deal of real-world general intelligence consists of the adaptation of intelligent systems to particular distributions ν over environment-space, differing from the universal distribution.

We then define

Definition 4 *The* **biased universal intelligence** *of an agent π is its expected performance with respect to the distribution ν over the space of all computable reward-summable environments, E, that is,*

$$\Upsilon(\pi) \equiv \sum_{\mu \in E} \nu(\mu) V_\mu^\pi$$

Legg and Hutter's **universal intelligence** is obtained by setting ν equal to the universal distribution.

This framework is more flexible than it might seem. E.g. suppose one wants to incorporate agents that die. Then one may create a special action, say a_{666}, corresponding to the state of death, to create agents that

- in certain circumstances output action a_{666}
- have the property that if their previous action was a_{666}, then all of their subsequent actions must be a_{666}

and to define a reward structure so that actions a_{666} always bring zero reward. It then follows that death is generally a bad thing if one wants to maximize intelligence. Agents that die will not get rewarded after they're dead; and agents that live only 70 years, say, will be restricted from getting rewards involving long-term patterns and will hence have specific limits on their intelligence.

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7.3.2 Connecting Legg and Hutter's Model of Intelligent Agents to the Real World

A notable aspect of the Legg and Hutter formalism is the separation of the reward mechanism from the cognitive mechanisms of the agent. While commonplace in the reinforcement learning literature, this seems psychologically unrealistic in the context of biological intelligences and many types of machine intelligences. Not all human intelligent activity is specifically reward-seeking in nature; and even when it is, humans often pursue complexly constructed rewards, that are defined in terms of their own cognitions rather than separately given. Suppose a certain human's goals are true love, or world peace, and the proving of interesting theorems – then these goals are defined by the human herself, and only she knows if she's achieved them. An externally-provided reward signal doesn't capture the nature of this kind of goal-seeking behavior, which characterizes much human goal-seeking activity (and will presumably characterize much of the goal-seeking activity of advanced engineered intelligences also) ... let alone human behavior that is spontaneous and unrelated to explicit goals, yet may still appear commonsensically intelligent.

One could seek to bypass this complaint about the reward mechanisms via a sort of "neo-Freudian" argument, via

- associating the reward signal, not with the "external environment" as typically conceived, but rather with a portion of the intelligent agent's brain that is separate from the cognitive component
- viewing complex goals like true love, world peace and proving interesting theorems as indirect ways of achieving the agent's "basic goals", created within the agent's memory via subgoaling mechanisms

but it seems to us that a general formalization of intelligence should not rely on such strong assumptions about agents' cognitive architectures. So below, after introducing the pragmatic and efficient pragmatic general intelligence measures, we will propose an alternate interpretation wherein the mechanism of external rewards is viewed as a theoretical test framework for assessing agent intelligence, rather than a hypothesis about intelligent agent architecture.

In this alternate interpretation, formal measures like the universal, pragmatic and efficient pragmatic general intelligence are viewed as *not* directly applicable to real-world intelligences, because they involve the behaviors of agents over a wide variety of goals and environments, whereas in real life the opportunities to observe agents are more limited. However, they are viewed as being *indirectly* applicable to real-world agents, in the sense that an external intelligence can observe an agent's real-world behavior and then *infer* its likely intelligence according to these measures.

In a sense, this interpretation makes our formalized measures of intelligence the opposite of real-world IQ tests. An IQ test is a quantified, formalized test which is designed to approximately predict the informal, qualitative achievement of humans in real life. On the other hand, the formal definitions of intelligence we present here are quantified, formalized tests that are designed to capture abstract notions of intelligence, but which can be approximately evaluated on a real-world intelligent system by observing what it does in real life.

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7.3.3 Pragmatic General Intelligence

The above concept of biased universal intelligence is perfectly adequate for many purposes, but it is also interesting to explicitly introduce the notion of a *goal* into the calculation. This allows us to formally capture the notion presented in [Goe93a] of intelligence as "the ability to achieve complex goals in complex environments."

If the agent is acting in environment μ, and is provided with g_s corresponding to g at the start and the end of the time-interval $T = \{i \in (s, ..., t)\}$, then the *expected goal-achievement* of the agent, relative to g, during the interval is the expectation

$$V^{\pi}_{\mu,g,T} \equiv E(\sum_{i=s}^{t} r_g(I_{g,s,i}))$$

where the expectation is taken over all interaction sequences $I_{g,s,i}$ drawn according to μ. We then propose

Definition 5 *The* **pragmatic general intelligence** *of an agent π, relative to the distribution ν over environments and the distribution γ over goals, is its expected performance with respect to goals drawn from γ in environments drawn from ν, over the time-scales natural to the goals; that is,*

$$\Pi(\pi) \equiv \sum_{\mu \in E, g \in \mathcal{G}, T} \nu(\mu)\gamma(g,\mu)V^{\pi}_{\mu,g,T}$$

(in those cases where this sum is convergent).

This definition formally captures the notion that "intelligence is achieving complex goals in complex environments," where "complexity" is gauged by the assumed measures ν and γ.

If ν is taken to be the universal distribution, and γ is defined to weight goals according to the universal distribution, then pragmatic general intelligence reduces to universal intelligence.

Furthermore, it is clear that a universal algorithmic agent like AIXI [Hut05] would also have a high pragmatic general intelligence, under fairly broad conditions. As the interaction history grows longer, the pragmatic general intelligence of AIXI would approach the theoretical maximum; as AIXI would implicitly infer the relevant distributions via experience. However, if significant reward discounting is involved, so that near-term rewards are weighted much higher than long-term rewards, then AIXI might compare very unfavorably in pragmatic general intelligence, to other agents designed with prior knowledge of ν, γ and τ in mind.

The most interesting case to consider is where ν and γ are taken to embody some particular bias in a real-world space of environments and goals, and this bias is appropriately reflected in the internal structure of an intelligent agent. Note that an agent needs not lack universal intelligence in order to possess pragmatic general intelligence with respect to some non-universal distribution over goals and environments. However, in general, given limited resources, there may be a tradeoff between universal intelligence and pragmatic intelligence. Which leads to the next point: how to encompass resource limitations into the definition.

One might argue that the definition of Pragmatic General Intelligence is already encompassed by Legg and Hutter's definition because one may bias the distribution of environments within the latter by considering different Turing machines underlying the Kolmogorov complexity. However this is not a general equivalence because the Solomonoff-Levin measure intrinsically

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decays exponentially, whereas an assumptive distribution over environments might decay at some other rate. This issue seems to merit further mathematical investigation.

7.3.4 Incorporating Computational Cost

Let $\eta_{\pi,\mu,g,T}$ be a probability distribution describing the amount of computational resources consumed by an agent π while achieving goal g over time-scale T. This is a probability distribution because we want to account for the possibility of nondeterministic agents. So, $\eta_{\pi,\mu,g,T}(Q)$ tells the probability that Q units of resources are consumed. For simplicity we amalgamate space and time resources, energetic resources, etc. into a single number Q, which is assumed to live in some subset of the positive reals. Space resources of course have to do with the size of the system's memory. Then we may define

Definition 6 *The* **efficient pragmatic general intelligence** *of an agent π with resource consumption $\eta_{\pi,\mu,g,T}$, relative to the distribution ν over environments and the distribution γ over goals, is its expected performance with respect to goals drawn from γ in environments drawn from ν, over the time-scales natural to the goals, normalized by the amount of computational effort expended to achieve each goal; that is,*

$$\Pi_{Eff}(\pi) \equiv \sum_{\mu \in E, g \in \mathcal{G}, Q, T} \frac{\nu(\mu)\gamma(g,\mu)\eta_{\pi,\mu,g,T}(Q)}{Q} V^{\pi}_{\mu,g,T}$$

(in those cases where this sum is convergent).

This is a measure that rates an agent's intelligence higher if it uses fewer computational resources to do its business. Roughly, it measures reward achieved per spacetime computation unit.

Note that, by abandoning the universal prior, we have also abandoned the proof of convergence that comes with it. In general the sums in the above definitions need not converge; and exploration of the conditions under which they do converge is a complex matter.

7.3.5 Assessing the Intelligence of Real-World Agents

The pragmatic and efficient pragmatic general intelligence measures are more "realistic" than the Legg and Hutter universal intelligence measure, in that they take into account the innate biasing and computational resource restrictions that characterize real-world intelligence. But as discussed earlier, they still live in "fantasy-land" to an extent – they gauge the intelligence of an agent via a weighted average over a wide variety of goals and environments; and they presume a simplistic relationship between agents and rewards that does not reflect the complexities of real-world cognitive architectures. It is not obvious from the foregoing how to apply these measures to real-world intelligent systems, which lack the ability to exist in such a wide variety of environments within their often brief lifespans, and mostly go about their lives doing things other than pursuing quantified external rewards. In this brief section we describe an approach to bridging this gap. The treatment is left semi-formal in places.

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We suggest to view the definitions of pragmatic and efficient pragmatic general intelligence in terms of a "possible worlds" semantics – i.e. to view them as asking, counterfactually, how an agent *would* perform, hypothetically, on a series of tests (the tests being goals, defined in relation to environments and reward signals).

Real-world intelligent agents don't normally operate in terms of explicit goals and rewards; these are abstractions that we use to think about intelligent agents. However, this is no objection to characterizing various sorts of intelligence in terms of counterfactuals like: how would system S operate if it were trying to achieve this or that goal, in this or that environment, in order to seek reward? We can characterize various sorts of intelligence in terms of how it can be inferred an agent would perform on certain tests, even though the agent's real life does not consist of taking these tests.

This conceptual approach may seem a bit artificial but we don't currently see a better alternative, if one wishes to quantitatively gauge intelligence (which is, in a sense, an "artificial" thing to do in the first place). Given a real-world agent X and a mandate to assess its intelligence, the obvious alternative to looking at possible worlds in the manner of the above definitions, is just looking *directly* at the properties of the things X has achieved in the real world during its lifespan. But this isn't an easy solution, because it doesn't disambiguate which aspects of X's achievements were due to its own actions versus due to the rest of the world that X was interacting with when it made its achievements. To distinguish the amount of achievement that X "caused" via its own actions requires a model of causality, which is a complex can of worms in itself; and, critically, the standard models of causality also involve counterfactuals (asking "what would have been achieved in this situation if the agent X hadn't been there", etc.) [MW07]. Regardless of the particulars, it seems impossible to avoid counterfactual realities in assessing intelligence.

The approach we suggest – given a real-world agent X with a history of actions in a particular world, and a mandate to assess its intelligence – is to introduce an additional player, an *inference agent* δ, into the picture. The agent π modeled above is then viewed as π_X: the model of X that δ constructs, in order to explore X's inferred behaviors in various counterfactual environments. In the test situations embodied in the definitions of pragmatic and efficient pragmatic general intelligence, the environment gives π_X rewards, based on specifically configured goals. In X's real life, the relation between goals, rewards and actions will generally be significantly subtler and perhaps quite different.

We model the real world similarly to the "fantasy world" of the previous section, but with the omission of goals and rewards. We define a *naturalistic* context as one in which all goals and rewards are constant, i.e. $g_i = g_0$ and $r_i = r_0$ for all i. This is just a mathematical convention for stating that there are no precisely-defined external goals and rewards for the agent. In a naturalistic context, we then have a situation where agents create actions based on the past history of actions and perceptions, and if there is any relevant notion of reward or goal, it is within the cognitive mechanism of some agent. A *naturalistic agent* X is then an agent π which is restricted to one particular naturalistic context, involving one particular environment μ (formally, we may achieve this within the framework of agents described above via dictating that X issues constant "null actions" a_0 in all environments except μ).

Next, we posit a metric space (Σ_μ, d) of naturalistic agents defined on a naturalistic context involving environment μ, and a subspace $\Delta \in \Sigma_\mu$ of inference agents, which are naturalistic agents that output predictions of other agents' behaviors (a notion we will not fully formalize here). If agents are represented as program trees, then d may be taken as edit distance on tree space [Bil05]. Then, for each agent $\delta \in \Delta$, we may assess

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- the prior probability $\theta(\delta)$ according to some assumed distribution θ
- the effectiveness $p(\delta, X)$ of δ at predicting the actions of an agent $X \in \Sigma_\mu$

We may then define

Definition 7 *The* **inference ability** *of the agent δ, relative to μ and X, is*

$$q_{\mu,X}(\delta) = \theta(\delta) \frac{\sum_{Y \in \Sigma_\mu} sim(X,Y) p(\delta, Y)}{\sum_{Y \in \Sigma_\mu} sim(X,Y)}$$

where sim is a specified decreasing function of $d(X,Y)$, such as $sim(X,Y) = \frac{1}{1+d(X,Y)}$.

To construct π_X, we may then use the model of X created by the agent $\delta \in \Delta$ with the highest inference ability relative to μ and X (using some specified ordering, in case of a tie). Having constructed π_X, we can then say that

Definition 8 *The inferred pragmatic general intelligence (relative to ν and γ) of a naturalistic agent X defined relative to an environment μ, is defined as the pragmatic general intelligence of the model π_X of X produced by the agent $\delta \in \Delta$ with maximal inference ability relative to μ (and in the case of a tie, the first of these in the ordering defined over Δ). The inferred efficient pragmatic general intelligence of X relative to μ is defined similarly.*

This provides a precise characterization of the pragmatic and efficient pragmatic intelligence of real-world systems, based on their observed behaviors. It's a bit messy; but the real world tends to be like that.

7.4 Intellectual Breadth: Quantifying the Generality of an Agent's Intelligence

We turn now to a related question: How can one quantify the degree of **generality** that an intelligent agent possesses? Above we have discussed the qualitative distinction between AGI and "Narrow AI", and intelligence as we have formalized it above is specifically intended as a measure of general intelligence. But quantifying intelligence is different than quantifying generality versus narrowness.

To make the discussion simpler, we introduce the term "context" as a shorthand for "environment/interval triple (μ, g, T)." Given a context (μ, g, T), and a set Σ of agents, one may construct a fuzzy set $Ag_{\mu,g,T}$ gathering those agents that are intelligent relative to the context; and given a set of contexts, one may also define a fuzzy set Con_π gathering those contexts with respect to which a given agent π is intelligent. The relevant formulas are:

$$\chi_{Ag_{\mu,g,T}}(\pi) = \chi_{Con_\pi}(\mu, g, T) = \frac{1}{N} \sum_Q \frac{\eta_{\mu,g,T}(Q) V^\pi_{\mu,g,T}}{Q}$$

where $N = N(\mu, g, T)$ is a normalization factor defined appropriately, e.g. via $N(\mu, g, T) = \max_\pi V^\pi_{\mu,g,T}$.

One could make similar definitions leaving out the computational cost factor Q, but we suspect that incorporating Q is a more promising direction. We then propose

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Definition 9 *The* **intellectual breadth** *of an agent π, relative to the distribution ν over environments and the distribution γ over goals, is*

$$H(\chi^P_{Con_\pi}(\mu, g, T))$$

where H is the entropy and

$$\chi^P_{Con_\pi}(\mu, g, T) = \frac{\nu(\mu)\gamma(g, \mu)\chi_{Con_\pi}(\mu, g, T)}{\sum_{(\mu_\alpha, g_\beta, T_\omega)} \nu(\mu_\alpha)\gamma(g_\beta, \mu_\alpha)\chi_{Con_\pi}(\mu_\alpha, g_\beta, T_\omega)}$$

is the probability distribution formed by normalizing the fuzzy set $\chi_{Con_\pi}(\mu, g, T)$.

A similar definition of the intellectual breadth of a context (μ, g, T), relative to the distribution σ over agents, may be posited. A weakness of these definitions is that they don't try to account for dependencies between agents or contexts; perhaps more refined formulations may be developed that account explicitly for these dependencies.

Note that the intellectual breadth of an agent as defined here is largely independent of the (efficient or not) pragmatic general intelligence of that agent. One could have a rather (efficiently or not) pragmatically generally intelligent system with little breadth: this would be a system very good at solving a fair number of hard problems, yet wholly incompetent on a larger number of hard problems. On the other hand, one could also have a terribly (efficiently or not) pragmatically generally stupid system with great intellectual breadth: i.e a system roughly equally dumb in all contexts!

Thus, one can characterize an intelligent agent as "narrow" with respect to distribution ν over environments and the distribution γ over goals, based on evaluating it as having low intellectual breadth. A "narrow AI" relative to ν and γ would then be an AI agent with a relatively high efficient pragmatic general intelligence but a relatively low intellectual breadth.

7.5 Conclusion

Our main goal in this chapter has been to push the formal understanding of intelligence in a more pragmatic direction. Much more work remains to be done, e.g. in specifying the environment, goal and efficiency distributions relevant to real-world systems, but we believe that the ideas presented here constitute nontrivial progress.

If the line of research suggested in this chapter succeeds, then eventually, one will be able to do AGI research as follows: Specify an AGI architecture formally, and then use the mathematics of general intelligence to derive interesting results about the environments, goals and hardware platforms relative to which the AGI architecture will display significant pragmatic or efficient pragmatic general intelligence, and intellectual breadth. The remaining chapters in this section present further ideas regarding how to work toward this goal. For the time being, such a mode of AGI research remains mainly for the future, but we have still found the formalism given in these chapters useful for formulating and clarifying various aspects of the CogPrime design as will be presented in later chapters.

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Chapter 8
Cognitive Synergy

8.1 Cognitive Synergy

As we have seen, the formal theory of general intelligence, in its current form, doesn't really tell us much that's of use for creating real-world AGI systems. It tells us that creating extraordinarily powerful general intelligence is almost trivial if one has unrealistically huge amounts of computational resources; and that creating moderately powerful general intelligence using feasible computational resources is all about creating AI algorithms and data structures that (explicitly or implicitly) match the restrictions implied by a certain class of situations, to which the general intelligence is biased.

We've also described, in various previous chapters, some non-rigorous, conceptual principles that seem to explain key aspects of feasible general intelligence: the complementary reliance on evolution and autopoiesis, the superposition of hierarchical and heterarchical structures, and so forth. These principles can be considered as broad strategies for achieving general intelligence in certain broad classes of situations. Although, a lot of research needs to be done to figure out nice ways to describe, for instance, in what class of situations evolution is an effective learning strategy, in what class of situations dual hierarchical/heterarchical structure is an effective way to organize memory, etc.

In this chapter we'll dig deeper into one of the "general principle of feasible general intelligences" briefly alluded to earlier: the *cognitive synergy* principle, which is both a conceptual hypothesis about the structure of generally intelligent systems in certain classes of environments, and a design principle used to guide the architecting of CogPrime.

We will focus here on cognitive synergy specifically in the case of "multi-memory systems," which we define as intelligent systems (like CogPrime) whose combination of environment, embodiment and motivational systems make it important for them to possess memories that divide into partially but not wholly distinct components corresponding to the categories of:

- Declarative memory
- Procedural memory (memory about how to do certain things)
- Sensory and episodic memory
- Attentional memory (knowledge about what to pay attention to in what contexts
- Intentional memory (knowledge about the system's own goals and subgoals)

In Chapter 9 below we present a detailed argument as to how the requirement for a multi-memory underpinning for general intelligence emerges from certain underlying assumptions

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regarding the measurement of the simplicity of goals and environments; but the points made here do not rely on that argument. What they do rely on is the assumption that, in the intelligence in question, the different components of memory are significantly but not wholly distinct. That is, there are significant "family resemblances" between the memories of a single type, yet there are also thoroughgoing connections between memories of different types.

The cognitive synergy principle, if correct, applies to any AI system demonstrating intelligence in the context of embodied, social communication. However, one may also take the theory as an explicit guide for constructing AGI systems; and of course, the bulk of this book describes one AGI architecture, CogPrime, designed in such a way.

It is possible to cast these notions in mathematical form, and we make some efforts in this direction in Appendix **??**, using the languages of category theory and information geometry. However, this formalization has not yet led to any rigorous proof of the generality of cognitive synergy nor any other exciting theorems; with luck this will come as the mathematics is further developed. In this chapter the presentation is kept on the heuristic level, which is all that is critically needed for motivating the CogPrime design.

8.2 Cognitive Synergy

The essential idea of cognitive synergy, in the context of multi-memory systems, may be expressed in terms of the following points:

1. Intelligence, relative to a certain set of environments, may be understood as the capability to achieve complex goals in these environments.
2. With respect to certain classes of goals and environments (see Chapter 9 for a hypothesis in this regard), an intelligent system requires a "multi-memory" architecture, meaning the possession of a number of specialized yet interconnected knowledge types, including: declarative, procedural, attentional, sensory, episodic and intentional (goal-related). These knowledge types may be viewed as different sorts of patterns that a system recognizes in itself and its environment. Knowledge of these various different types must be interlinked, and in some cases may represent differing views of the same content (see Figure **??**)
3. Such a system must possess knowledge creation (i.e. pattern recognition / formation) mechanisms corresponding to each of these memory types. These mechanisms are also called "cognitive processes."
4. Each of these cognitive processes, to be effective, must have the capability to recognize when it lacks the information to perform effectively on its own; and in this case, to dynamically and interactively draw information from knowledge creation mechanisms dealing with other types of knowledge
5. This cross-mechanism interaction must have the result of enabling the knowledge creation mechanisms to perform much more effectively in combination than they would if operated non-interactively. This is "cognitive synergy."

While these points are implicit in the theory of mind given in [Goe06a], they are not articulated in this specific form there.

Interactions as mentioned in Points 4 and 5 in the above list are the real conceptual meat of the cognitive synergy idea. One way to express the key idea here is that most AI algorithms suffer from combinatorial explosions: the number of possible elements to be combined in a

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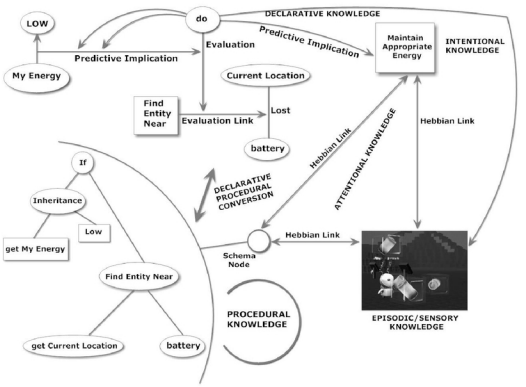

Fig. 8.1: Illustrative example of the interactions between multiple types of knowledge, in representing a simple piece of knowledge. Generally speaking, one type of knowledge can be converted to another, at the cost of some loss of information. The synergy between cognitive processes associated with corresponding pieces of knowledge, possessing different type, is a critical aspect of general intelligence.

synthesis or analysis is just too great, and the algorithms are unable to filter through all the possibilities, given the lack of intrinsic constraint that comes along with a "general intelligence" context (as opposed to a narrow-AI problem like chess-playing, where the context is constrained and hence restricts the scope of possible combinations that needs to be considered). In an AGI architecture based on cognitive synergy, the different learning mechanisms must be designed specifically to interact in such a way as to palliate each others' combinatorial explosions - so that, for instance, each learning mechanism dealing with a certain sort of knowledge, must synergize with learning mechanisms dealing with the other sorts of knowledge, in a way that decreases the severity of combinatorial explosion.

One prerequisite for cognitive synergy to work is that each learning mechanism must recognize when it is "stuck," meaning it's in a situation where it has inadequate information to make a confident judgment about what steps to take next. Then, when it does recognize that it's stuck, it may request help from other, complementary cognitive mechanisms.

A theoretical notion closely related to cognitive synergy is the *cognitive schematic*, formalized in Chapter 7 above, which states that the activity of the different cognitive processes involved in an intelligent system may be modeled in terms of the schematic implication

$$Context \wedge Procedure \rightarrow Goal$$

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where the Context involves sensory, episodic and/or declarative knowledge; and attentional knowledge is used to regulate how much resource is given to each such schematic implication in memory. Synergy among the learning processes dealing with the context, the procedure and the goal is critical to the adequate execution of the cognitive schematic using feasible computational resources.

Finally, drilling a little deeper into Point 3 above, one arrives at a number of possible knowledge creation mechanisms (cognitive processes) corresponding to each of the key types of knowledge. Figure **??** below gives a high-level overview of the main types of cognitive process considered in the current version of Cognitive Synergy Theory, categorized according to the type of knowledge with which each process deals.

8.3 Cognitive Synergy in CogPrime

Different cognitive systems will use different processes to fulfill the various roles identified in Figure **??** above. Here we briefly preview the basic cognitive processes that the CogPrime AGI design uses for these roles, and the synergies that exist between these.

8.3.1 Cognitive Processes in CogPrime

: a Cognitive Synergy Based Architecture..." from ICCI 2009

Table 8.1: default

|Table will go here|

Table 8.2: The OpenCogPrime data structures used to represent the key knowledge types involved

Table 8.3: default

|Table will go here|

Table 8.4: Key cognitive processes, and the algorithms that play their roles in CogPrime

Tables 8.1 and 8.3 present the key structures and processes involved in CogPrime, identifying each one with a certain memory/process type as considered in cognitive synergy theory. That is: each of these cognitive structures or processes deals with one or more types of memory – declarative, procedural, sensory, episodic or attentional. Table 8.5 describes the key CogPrime

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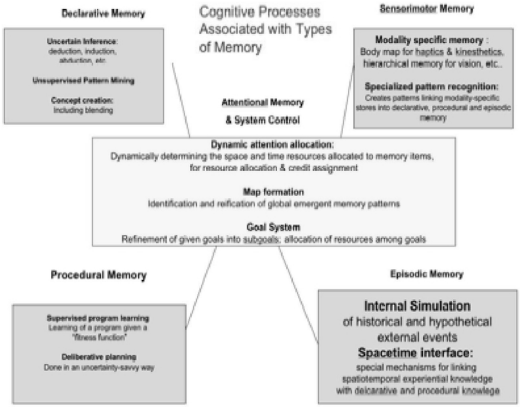

Fig. 8.2: High-level overview of the key cognitive dynamics considered here in the context of cognitive synergy. The cognitive synergy principle describes the behavior of a system as it pursues a set of goals (which in most cases may be assumed to be supplied to the system "a priori", but then refined by inference and other processes). The assumed intelligent agent model is roughly as follows: At each time the system chooses a set of procedures to execute, based on its judgments regarding which procedures will best help it achieve its goals in the current context. These procedures may involve external actions (e.g. involving conversation, or controlling an agent in a simulated world) and/or internal cognitive actions. In order to make these judgments it must effectively manage declarative, procedural, episodic, sensory and attentional memory, each of which is associated with specific algorithms and structures as depicted in the diagram. There are also global processes spanning all the forms of memory, including the allocation of attention to different memory items and cognitive processes, and the identification and reification of system-wide activity patterns (the latter referred to as "map formation")

Table 8.5: default

|Table will go here|

Table 8.6: Key OpenCogPrime cognitive processes categorized according to knowledge type and process type

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processes in terms of the "analysis vs. synthesis" distinction. Finally, Tables ?? and ?? exemplify these structures and processes in the context of embodied virtual agent control.

In the CogPrime context, a procedure in this cognitive schematic is a program tree stored in the system's procedural knowledge base; and a context is a (fuzzy, probabilistic) logical predicate stored in the AtomSpace, that holds, to a certain extent, during each interval of time. A goal is a fuzzy logical predicate that has a certain value at each interval of time, as well.

Attentional knowledge is handled in CogPrime by the ECAN artificial economics mechanism, that continually updates ShortTermImportance and LongTerm Importance values associated with each item in the CogPrime system's memory, which control the amount of attention other cognitive mechanisms pay to the item, and how much motive the system has to keep the item in memory. HebbianLinks are then created between knowledge items that often possess ShortTermImportance at the same time; this is CogPrime's version of traditional Hebbian learning.

ECAN has deep interactions with other cognitive mechanisms as well, which are essential to its efficient operation; for instance, PLN inference may be used to help ECAN extrapolate conclusions about what is worth paying attention to, and MOSES may be used to recognize subtle attentional patterns. ECAN also handles "assignment of credit", the figuring-out of the causes of an instance of successful goal-achievement, drawing on PLN and MOSES as needed when the causal inference involved here becomes difficult.

The synergies between CogPrime's cognitive processes are well summarized below, which is a 16x16 matrix summarizing a host of interprocess interactions generic to CST.

One key aspect of how CogPrime implements cognitive synergy is PLN's sophisticated management of the confidence of judgments. This ties in with the way OpenCogPrime's PLN inference framework represents truth values in terms of multiple components (as opposed to the single probability values used in many probabilistic inference systems and formalisms): each item in OpenCogPrime's declarative memory has a confidence value associated with it, which tells how much weight the system places on its knowledge about that memory item. This assists with cognitive synergy as follows: A learning mechanism may consider itself "stuck", generally speaking, when it has no high-confidence estimates about the next step it should take.

Without reasonably accurate confidence assessment to guide it, inter-component interaction could easily lead to increased rather than decreased combinatorial explosion. And of course there is an added recursion here, in that confidence assessment is carried out partly via PLN inference, which in itself relies upon these same synergies for its effective operation.

To illustrate this point further, consider one of the synergetic aspects described in ?? below: the role cognitive synergy plays in deductive inference. Deductive inference is a hard problem in general - but what is hard about it is not carrying out inference steps, but rather "inference control" (i.e., choosing which inference steps to carry out). Specifically, what must happen for deduction to succeed in CogPrime is:

1. the system must recognize when its deductive inference process is "stuck", i.e. when the PLN inference control mechanism carrying out deduction has no clear idea regarding which inference step(s) to take next, even after considering all the domain knowledge at is disposal
2. in this case, the system must defer to another learning mechanism to gather more information about the different choices available - and the other learning mechanism chosen must, a reasonable percentage of the time, actually provide useful information that helps PLN to get "unstuck" and continue the deductive process

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For instance, deduction might defer to the "attentional knowledge" subsystem, and make a judgment as to which of the many possible next deductive steps are most associated with the goal of inference and the inference steps taken so far, according to the HebbianLinks constructed by the attention allocation subsystem, based on observed associations. Or, if this fails, deduction might ask MOSES (running in supervised categorization mode) to learn predicates characterizing some of the terms involving the possible next inference steps. Once MOSES provides these new predicates, deduction can then attempt to incorporate these into its inference process, hopefully (though not necessarily) arriving at a higher-confidence next step.

8.4 Some Critical Synergies

Referring back to Figure ??, and summarizing many of the ideas in the previous section, Table ?? enumerates a number of specific ways in which the cognitive processes mentioned in the Figure may synergize with one another, potentially achieving dramatically greater efficiency than would be possible on their own.

Of course, realizing these synergies on the practical algorithmic level requires significant inventiveness and may be approached in many different ways. The specifics of how CogPrime manifests these synergies are discussed in many following chapters.

How —> Helps | |/	**Map formation**	**Goal system**	**Simulation**	**Sensorimotor pattern recognition**
Uncertain inference	Creates new concepts and relationships, enabling briefer useful inference trails	Goal refinement enables more careful goal-based inference pruning	- Simulations provide a method of testing speculative inferential conclusions - Simulations suggest hypotheses to be explored via inference	Creates new concepts and relationships, enabling briefer useful inference trails
Supervised procedure learning	Creates new procedures to be used as modules in candidate procedures	Goal refinement allows more precise definition of fitness functions, making procedure learning's job easier	Simulation provides a method of "fitness estimation" allowing inexpensive testing of candidate procedures	Extraction of sensorimotor patterns allows creation of abstracted fitness functions for (inferentially and simulatively) evaluating procedures guiding real-world actions
Attention allocation	Creates new concepts grouping "attentionally related" memory items, enabling AA to find subtler attentional patterns involving these nodes	Goal refinement allows more accurately goal-driven allocation of attention	Simulation provides data for attention allocation – allowing attentional information to be extracted from co-occurences observed in simulation	Creates concepts grouping "attentionally related" memory items, enabling AA to find subtler attentional patterns involving these nodes
Concept creation	Creates new concepts to be fed into other concept creation mechanisms	Goal refinement provides more precise definition of criteria via which new concepts are created	Utility of concepts may be assessed via creating simulated entities embodying the new concepts and seeing what they lead to in simulation	Creates new concepts to be fed into other concept creation mechanisms

Fig. 8.3: This table, and the following ones, show some of the synergies between the primary cognitive processes explicitly used in CogPrime.

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How ---> Helps |\/	Uncertain inference	Supervised procedure learning	Attention allocation	Concept creation
Uncertain inference	NA	When inference gets stuck in an inference trail, it can ask procedure learning to learn new patterns regarding concepts in the inference trail (if there is adequate data regarding the concepts)	Importance levels allow pruning of inference trees	Provides new concepts, allowing briefer useful inference trails
Supervised procedure learning	Inference can be used to allow prior experience to guide each instance of procedure learning.	NA	Importance levels may be used to bias choices made in the course of procedure learning (e.g. in OGP, in the fitness evaluation and representation-building phases of MOSES)	Provides new concepts, allowing compacter programs using new concepts in various roles
Attention allocation	Enables inference of new HebbianLinks and HebbianPredicates from existing ones	Procedure learning can recognize patterns in historical system activity, which are then used to build concepts and relationships guiding attention allocation	NA	Combination of concepts formed via map formation, may lead to new concepts that even better direct attention
Concept creation	Allows inferential assessment of the value of new concepts	Procedure learning can be used to search for high-quality blends of existing concepts (using e.g. inferential and attentional knowledge in the fitness functions)	Allows assessment of the value of new concepts based on historical attentional knowledge	NA

How ---> Helps |\/	Uncertain inference	Supervised procedure learning	Attention allocation	Concept creation
Map formation	Speculative inference can help map formation guess which maps to hunt for	Procedure learning can be used to search for maps that are more complex than mere "co-occurrence"	Attention allocation provides the raw data for map formation	*No significant direct synergy*
Goal system	Inference can carry out goal refinement	*No significant direct synergy*	Flow of importance among subgoals determines which subgoals get used, versus being forgotten	Concept creation can be used to provide raw data for goal refinement (e.g. a new subgoal that blends two others)
Simulation	In order to provide data for setting up simulations, inference will often be needed	*No significant direct synergy*	Attention allocation tells which portions of a simulation need to be run in more detail	*No significant direct synergy*
Sensorimotor pattern recognition	Speculative inference helps fill in gaps in sensory data	Procedure learning can be used to find subtle patterns in sensorimotor data	Attention allocation guides pattern recognition via indicating which sensorimotor stimuli and patterns tend to be associatively linked	New concepts may be created that then are found to serve as significant patterns in sensorimotor data

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How ---> Helps ↓ ⇓	Map formation	Goal system	Simulation	Sensorimotor pattern recognition
Map formation	NA	Map formation may focus on finding maps related to subgoals, and good subgoal refinement helps here	*No significant direct synergy*	*No significant direct synergy*
Goal system	Concepts formed from maps may be useful raw material for forming subgoals	NA	*No significant direct synergy*	*No significant direct synergy*
Simulation	*No significant direct synergy*	*No significant direct synergy*	NA	Presence of recognized sensorimotor patterns may be used to judge whether a simulation is sufficiently accurate
Sensorimotor pattern recognition	Concepts formed from maps may usefully guide sensorimotor pattern search	Directing pattern search toward patterns pertinent to subgoals, may make the task far easier	Patterns recognized in simulations may then be checked for presence in real sensorimotor data	NA

8.5 The Cognitive Schematic

Now we return to the "cognitive schematic" notion, according to which various cognitive processes involved in intelligence may be understood to work together via the implication

$$Context \wedge Procedure \rightarrow Goal < p >$$

(summarized $C \wedge P \rightarrow G$). Semi-formally, this implication may be interpreted to mean: "If the context C appears to hold currently, then if I enact the procedure P, I can expect to achieve the goal G with certainty p."

The cognitive schematic leads to a conceptualization of the internal action of an intelligent system as involving two key categories of learning:

- **Analysis**: Estimating the probability p of a posited $C \wedge P \rightarrow G$ relationship
- **Synthesis**: Filling in one or two of the variables in the cognitive schematic, given assumptions regarding the remaining variables, and directed by the goal of maximizing the probability of the cognitive schematic

More specifically, where synthesis is concerned, some key examples are:

- The MOSES probabilistic evolutionary program learning algorithm is applied to find P, given fixed C and G. Internal simulation is also used, for the purpose of creating a simulation embodying C and seeing which P lead to the simulated achievement of G.
  - *Example: A virtual dog learns a procedure P to please its owner (the goal G) in the context C where there is a ball or stick present and the owner is saying "fetch".*
- PLN inference, acting on declarative knowledge, is used for choosing C, given fixed P and G (also incorporating sensory and episodic knowledge as appropriate). Simulation may also be used for this purpose.

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  - *Example: A virtual dog wants to achieve the goal G of getting food, and it knows that the procedure P of begging has been successful at this before, so it seeks a context C where begging can be expected to get it food. Probably this will be a context involving a friendly person.*

- PLN-based goal refinement is used to create new subgoals G to sit on the right hand side of instances of the cognitive schematic.
  - *Example: Given that a virtual dog has a goal of finding food, it may learn a subgoal of following other dogs, due to observing that other dogs are often heading toward their food.*

- Concept formation heuristics are used for choosing G and for fueling goal refinement, but especially for choosing C (via providing new candidates for C). They are also used for choosing P, via a process called "predicate schematization" that turns logical predicates (declarative knowledge) into procedures.
  - *Example: At first a virtual dog may have a hard time predicting which other dogs are going to be mean to it. But it may eventually observe common features among a number of mean dogs, and thus form its own concept of "pit bull," without anyone ever teaching it this concept explicitly.*

Where analysis is concerned:

- PLN inference, acting on declarative knowledge, is used for estimating the probability of the implication in the cognitive schematic, given fixed C, P and G. Episodic knowledge is also used this regard, via enabling estimation of the probability via simple similarity matching against past experience. Simulation is also used: multiple simulations may be run, and statistics may be captured therefrom.
  - *Example: To estimate the degree to which asking Bob for food (the procedure P is "asking for food", the context C is "being with Bob") will achieve the goal G of getting food, the virtual dog may study its memory to see what happened on previous occasions where it or other dogs asked Bob for food or other things, and then integrate the evidence from these occasions.*

- Procedural knowledge, mapped into declarative knowledge and then acted on by PLN inference, can be useful for estimating the probability of the implication $C \wedge P \rightarrow G$, in cases where the probability of $C \wedge P_1 \rightarrow G$ is known for some P_1 related to P.
  - *Example: knowledge of the internal similarity between the procedure of asking for food and the procedure of asking for toys, allows the virtual dog to reason that if asking Bob for toys has been successful, maybe asking Bob for food will be successful too.*

- Inference, acting on declarative or sensory knowledge, can be useful for estimating the probability of the implication $C \wedge P \rightarrow G$, in cases where the probability of $C_1 \wedge P \rightarrow G$ is known for some C_1 related to C.
  - *Example: if Bob and Jim have a lot of features in common, and Bob often responds positively when asked for food, then maybe Jim will too.*

- Inference can be used similarly for estimating the probability of the implication $C \wedge P \rightarrow G$, in cases where the probability of $C \wedge P \rightarrow G_1$ is known for some G_1 related to G. Concept

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creation can be useful indirectly in calculating these probability estimates, via providing new concepts that can be used to make useful inference trails more compact and hence easier to construct.

- *Example: The dog may reason that because Jack likes to play, and Jack and Jill are both children, maybe Jill likes to play too. It can carry out this reasoning only if its concept creation process has invented the concept of "child" via analysis of observed data.*

In these examples we have focused on cases where two terms in the cognitive schematic are fixed and the third must be filled in; but just as often, the situation is that only one of the terms is fixed. For instance, if we fix G, sometimes the best approach will be to collectively learn C and P. This requires either a procedure learning method that works interactively with a declarative-knowledge-focused concept learning or reasoning method; or a declarative learning method that works interactively with a procedure learning method. That is, it requires the sort of cognitive synergy built into the CogPrime design.

8.6 Cognitive Synergy for Procedural and Declarative Learning

We now present a little more algorithmic detail regarding the operation and synergetic interaction of CogPrime's two most sophisticated components: the MOSES procedure learning algorithm (see Chapter 33), and the PLN uncertain inference framework (see Chapter 34). The treatment is necessarily quite compact, since we have not yet reviewed the details of either MOSES or PLN; but as well as illustrating the notion of cognitive synergy more concretely, perhaps the high-level discussion here will make clearer how MOSES and PLN fit into the big picture of CogPrime.

8.6.1 Cognitive Synergy in MOSES

MOSES, CogPrime's primary algorithm for learning procedural knowledge, has been tested on a variety of application problems including standard GP test problems, virtual agent control, biological data analysis and text classification [Loo06]. It represents procedures internally as program trees. Each node in a MOSES program tree is supplied with a "knob," comprising a set of values that may potentially be chosen to replace the data item or operator at that node. So for instance a node containing the number 7 may be supplied with a knob that can take on any integer value. A node containing a while loop may be supplied with a knob that can take on various possible control flow operators including conditionals or the identity. A node containing a procedure representing a particular robot movement, may be supplied with a knob that can take on values corresponding to multiple possible movements. Following a metaphor suggested by Douglas Hofstadter [Hof96], MOSES learning covers both "knob twiddling" (setting the values of knobs) and "knob creation."

MOSES is invoked within CogPrime in a number of ways, but most commonly for finding a procedure P satisfying a probabilistic implication $C\&P \rightarrow G$ as described above, where C is an observed context and G is a system goal. In this case the probability value of the implication provides the "scoring function" that MOSES uses to assess the quality of candidate procedures.

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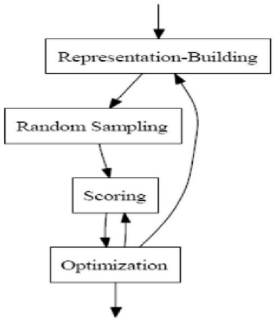

Fig. 8.4: High-Level Control Flow of MOSES Algorithm

For example, suppose an CogPrime -controlled robot is trying to learn to play the game of "tag." (I.e. a multi-agent game in which one agent is specially labeled "it", and runs after the other player agents, trying to touch them. Once another agent is touched, it becomes the new "it" and the previous "it" becomes just another player agent.) Then its context C is that others are trying to play a game they call "tag" with it; and we may assume its goals are to please them and itself, and that it has figured out that in order to achieve this goal it should learn some procedure to follow when interacting with others who have said they are playing "tag." In this case a potential tag-playing procedure might contain nodes for physical actions like $step_forward(speed\ s)$, as well as control flow nodes containing operators like $ifelse$ (for instance, there would probably be a conditional telling the robot to do something different depending on whether someone seems to be chasing it). Each of these program tree nodes would have an appropriate knob assigned to it. And the scoring function would evaluate a procedure P in terms of how successfully the robot played tag when controlling its behaviors according to P (noting that it may also be using other control procedures concurrently with P). It's worth noting here that evaluating the scoring function in this case involves some inference already, because in order to tell if it is playing tag successfully, in a real-world context, it must watch and understand the behavior of the other players.

MOSES follows the high-level control flow depicted in Figure 8.4, which corresponds to the following process for evolving a metapopulation of "demes" of programs (each deme being a set of relatively similar programs, forming a sort of island in program space):

1. Construct an initial set of knobs based on some prior (e.g., based on an empty program; or more interestingly, using prior knowledge **supplied by PLN inference** based on the system's memory) and use it to generate an initial random sampling of programs. Add this deme to the metapopulation.
2. Select a deme from the metapopulation and update its sample, as follows:

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a. Select some promising programs from the deme's existing sample to use for modeling, according to the scoring function.
b. Considering the promising programs as collections of knob settings, generate new collections of knob settings by applying some (competent) optimization algorithm. For best performance on difficult problems, it is important to use an optimization algorithm that makes use of the system's memory in its choices, **consulting PLN inference** to help estimate which collections of knob settings will work best.
c. Convert the new collections of knob settings into their corresponding programs, reduce the programs to normal form, evaluate their scores, and integrate them into the deme's sample, replacing less promising programs. In the case that scoring is expensive, score evaluation may be preceded by score estimation, which may use **PLN inference**, enaction of procedures in an **internal simulation environment**, and/or similarity matching against **episodic memory**.

3. For each new program that meet the criterion for creating a new deme, if any:

   a. Construct a new set of knobs (a process called "representation-building") to define a region centered around the program (the deme's *exemplar)*, and use it to generate a *new* random sampling of programs, producing a new deme.
   b. Integrate the new deme into the metapopulation, possibly displacing less promising demes.

4. Repeat from step 2.

MOSES is a complex algorithm and each part plays its role; if any one part is removed the performance suffers significantly [Loo06]. However, the main point we want to highlight here is the role played by synergetic interactions between MOSES and other cognitive components such as PLN, simulation and episodic memory, as indicated in **boldface** in the above pseudocode. MOSES is a powerful procedure learning algorithm, but used on its own it runs into scalability problems like any other such algorithm; the reason we feel it has potential to play a major role in a human-level AI system is its capacity for productive interoperation with other cognitive components.

Continuing the "tag" example, the power of MOSES's integration with other cognitive processes would come into play if, before learning to play tag, the robot has already played simpler games involving chasing. If the robot already has experience chasing and being chased by other agents, then its episodic and declarative memory will contain knowledge about how to pursue and avoid other agents in the context of running around an environment full of objects, and this knowledge will be deployable within the appropriate parts of MOSES's Steps 1 and 2. Cross-process and cross-memory-type integration make it tractable for MOSES to act as a "transfer learning" algorithm, not just a task-specific machine-learning algorithm.

8.6.2 Cognitive Synergy in PLN

While MOSES handles much of CogPrime's procedural learning, and OpenCogPrimes internal simulation engine handles most episodic knowledge, CogPrime's primary tool for handling declarative knowledge is an uncertain inference framework called Probabilistic Logic Networks (PLN). The complexities of PLN are the topic of a lengthy technical monograph [GMIH08], and

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here we will eschew most details and focus mainly on pointing out how PLN seeks to achieve efficient inference control via integration with other cognitive processes.

As a logic, PLN is broadly integrative: it combines certain term logic rules with more standard predicate logic rules, and utilizes both fuzzy truth values and a variant of imprecise probabilities called *indefinite probabilities*. PLN mathematics tells how these uncertain truth values propagate through its logic rules, so that uncertain premises give rise to conclusions with reasonably accurately estimated uncertainty values. This careful management of uncertainty is critical for the application of logical inference in the robotics context, where most knowledge is abstracted from experience and is hence highly uncertain.

PLN can be used in either forward or backward chaining mode; and in the language introduced above, it can be used for either analysis or synthesis. As an example, we will consider backward chaining analysis, exemplified by the problem of a robot preschool-student trying to determine whether a new playmate "Bob" is likely to be a regular visitor to its preschool or not (evaluating the truth value of the implication $Bob \rightarrow regular_visitor$). The basic backward chaining process for PLN analysis looks like:

1. Given an implication $L \equiv A \rightarrow B$ whose truth value must be estimated (for instance $L \equiv C\&P \rightarrow G$ as discussed above), create a list $(A_1, ..., A_n)$ of *(inference rule, stored knowledge)* pairs that might be used to produce L
2. Using analogical reasoning to prior inferences, assign each A_i a probability of success
   - If some of the A_i are estimated to have reasonable probability of success at generating reasonably confident estimates of L's truth value, then invoke Step 1 with A_i in place of L (at this point the inference process becomes recursive)
   - If none of the A_i looks sufficiently likely to succeed, then inference has "gotten stuck" and another cognitive process should be invoked, e.g.
     - **Concept creation** may be used to infer new concepts related to A and B, and then Step 1 may be revisited, in the hope of finding a new, more promising A_i involving one of the new concepts
     - **MOSES** may be invoked with one of several special goals, e.g. the goal of finding a procedure P so that $P(X)$ predicts whether $X \rightarrow B$. If MOSES finds such a procedure P then this can be converted to declarative knowledge understandable by PLN and Step 1 may be revisited....
     - **Simulations** may be run in CogPrime's internal simulation engine, so as to observe the truth value of $A \rightarrow B$ in the simulations; and then Step 1 may be revisited....

The combinatorial explosion of inference control is combatted by the capability to defer to other cognitive processes when the inference control procedure is unable to make a sufficiently confident choice of which inference steps to take next. Note that just as MOSES may rely on PLN to model its evolving populations of procedures, PLN may rely on MOSES to create complex knowledge about the terms in its logical implications. This is just one example of the multiple ways in which the different cognitive processes in CogPrime interact synergetically; a more thorough treatment of these interactions is given in Chapter 49.

In the "new playmate" example, the interesting case is where the robot initially seems not to know enough about Bob to make a solid inferential judgment (so that none of the A_i seem particularly promising). For instance, it might carry out a number of possible inferences and not come to any reasonably confident conclusion, so that the reason none of the A_i seem promising is that all the decent-looking ones have been tried already. So it might then recourse to MOSES, simulation or concept creation.

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For instance, the PLN controller could make a list of everyone who has been a regular visitor, and everyone who has not been, and pose MOSES the task of figuring out a procedure for distinguishing these two categories. This procedure could then used directly to make the needed assessment, or else be translated into logical rules to be used within PLN inference. For example, perhaps MOSES would discover that older males wearing ties tend not to become regular visitors. If the new playmate is an older male wearing a tie, this is directly applicable. But if the current playmate is wearing a tuxedo, then PLN may be helpful via reasoning that even though a tuxedo is not a tie, it's a similar form of fancy dress – so PLN may extend the MOSES-learned rule to the present case and infer that the new playmate is not likely to be a regular visitor.

8.7 Is Cognitive Synergy Tricky?

[1]

In this section we use the notion of cognitive synergy to explore a question that arises frequently in the AGI community: the well-known difficulty of measuring intermediate progress toward human-level AGI. We explore some potential reasons underlying this, via extending the notion of cognitive synergy to a more refined notion of "tricky cognitive synergy." These ideas are particularly relevant to the problem of creating a roadmap toward AGI, as we'll explore in Chapter 17 below.

8.7.1 The Puzzle: Why Is It So Hard to Measure Partial Progress Toward Human-Level AGI?

It's not entirely straightforward to create tests to measure the *final achievement* of human-level AGI, but there are some fairly obvious candidates here. There's the Turing Test (fooling judges into believing you're human, in a text chat), the video Turing Test, the Robot College Student test (passing university, via being judged exactly the same way a human student would), etc. There's certainly no agreement on which is the most meaningful such goal to strive for, but there's broad agreement that a number of goals of this nature basically make sense.

On the other hand, how does one measure whether one is, say, 50 percent of the way to human-level AGI? Or, say, 75 or 25 percent?

It's possible to pose many "practical tests" of incremental progress toward human-level AGI, with the property that if a proto-AGI system passes the test using a certain sort of architecture and/or dynamics, then this implies a certain amount of progress toward human-level AGI *based on particular theoretical assumptions about AGI*. However, in each case of such a practical test, it seems intuitively likely *to a significant percentage of AGI researchers* that there is some way to "game" the test via designing a system specifically oriented toward passing that test, and which doesn't constitute dramatic progress toward AGI.

Some examples of practical tests of this nature would be

[1] This section co-authored with Jared Wigmore

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- The Wozniak "coffee test": go into an average American house and figure out how to make coffee, including identifying the coffee machine, figuring out what the buttons do, finding the coffee in the cabinet, etc.
- Story understanding – reading a story, or watching it on video, and then answering questions about what happened (including questions at various levels of abstraction)
- Graduating (virtual-world or robotic) preschool
- Passing the elementary school reading curriculum (which involves reading and answering questions about some picture books as well as purely textual ones)
- Learning to play an arbitrary video game based on experience only, or based on experience plus reading instructions

One interesting point about tests like this is that each of them seems to *some* AGI researchers to encapsulate the crux of the AGI problem, and be unsolvable by any system not far along the path to human-level AGI – yet seems to other AGI researchers, with different conceptual perspectives, to be something probably game-able by narrow-AI methods. And of course, given the current state of science, there's no way to tell which of these practical tests really can be solved via a narrow-AI approach, except by having a lot of people try really hard over a long period of time.

A question raised by these observations is whether there is some *fundamental reason* why it's hard to make an objective, theory-independent measure of intermediate progress toward advanced AGI. Is it just that we haven't been smart enough to figure out the right test – or is there some conceptual reason why the very notion of such a test is problematic?

We don't claim to know for sure – but in the rest of this section we'll outline one possible reason why the latter might be the case.

8.7.2 A Possible Answer: Cognitive Synergy is Tricky!

Why might a solid, objective empirical test for intermediate progress toward AGI be an infeasible notion? One possible reason, we suggest, is precisely *cognitive synergy*, as discussed above.

The cognitive synergy hypothesis, in its simplest form, states that human-level AGI intrinsically depends on the synergetic interaction of multiple components (for instance, as in CogPrime, multiple memory systems each supplied with its own learning process). In this hypothesis, for instance, it might be that there are 10 critical components required for a human-level AGI system. Having all 10 of them in place results in human-level AGI, but having only 8 of them in place results in having a dramatically impaired system – and maybe having only 6 or 7 of them in place results in a system that can hardly do anything at all.

Of course, the reality is almost surely not as strict as the simplified example in the above paragraph suggests. No AGI theorist has really posited a list of 10 crisply-defined subsystems and claimed them necessary and sufficient for AGI. We suspect there are many different routes to AGI, involving integration of different sorts of subsystems. However, if the cognitive synergy hypothesis is correct, then human-level AGI behaves *roughly* like the simplistic example in the prior paragraph suggests. Perhaps instead of using the 10 components, you could achieve human-level AGI with 7 components, but having only 5 of these 7 would yield drastically impaired functionality – etc. Or the point could be made without any decomposition into a finite set of components, using continuous probability distributions. To mathematically formalize the

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cognitive synergy hypothesis becomes complex, but here we're only aiming for a qualitative argument. So for illustrative purposes, we'll stick with the "10 components" example, just for communicative simplicity.

Next, let's suppose that for any given task, there are ways to achieve this task using a system that is much simpler than any subset of size 6 drawn from the set of 10 components needed for human-level AGI, but works much better for the task than this subset of 6 components (assuming the latter are used as a set of only 6 components, without the other 4 components).

Note that this supposition is a good bit stronger than mere cognitive synergy. For lack of a better name, we'll call it *tricky cognitive synergy*. The tricky cognitive synergy hypothesis would be true if, for example, the following possibilities were true:

- creating components to serve as parts of a synergetic AGI is *harder* than creating components intended to serve as parts of simpler AI systems without synergetic dynamics
- components capable of serving as parts of a synergetic AGI are necessarily *more complicated* than components intended to serve as parts of simpler AGI systems.

These certainly seem reasonable possibilities, since to serve as a component of a synergetic AGI system, a component must have the internal flexibility to usefully handle interactions with a lot of other components as well as to solve the problems that come its way. In a CogPrime context, these possibilities ring true, in the sense that tailoring an AI process for tight integration with other AI processes within CogPrime, tends to require more work than preparing a conceptually similar AI process for use on its own or in a more task-specific narrow AI system.

It seems fairly obvious that, if tricky cognitive synergy really holds up as a property of human-level general intelligence, the difficulty of formulating tests for intermediate progress toward human-level AGI follows as a consequence. Because, according to the tricky cognitive synergy hypothesis, any test is going to be more easily solved by some simpler narrow AI process than by a *partially complete* human-level AGI system.

8.7.3 Conclusion

We haven't proved anything here, only made some qualitative arguments. However, these arguments do seem to give a plausible explanation for the empirical observation that positing tests for intermediate progress toward human-level AGI is a very difficult prospect. If the theoretical notions sketched here are correct, then this difficulty is not due to incompetence or lack of imagination on the part of the AGI community, nor due to the primitive state of the AGI field, but is rather intrinsic to the subject matter. And if these notions are correct, then quite likely the future rigorous science of AGI will contain formal theorems echoing and improving the qualitative observations and conjectures we've made here.

If the ideas sketched here are true, then the practical consequence for AGI development is, very simply, that one shouldn't worry a lot about producing intermediary results that are compelling to skeptical observers. Just at 2/3 of a human brain may not be of much use, similarly, 2/3 of an AGI system may not be much use. Lack of impressive intermediary results may not imply one is on a wrong development path; and comparison with narrow AI systems on specific tasks may be badly misleading as a gauge of incremental progress toward human-level AGI.

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Hopefully it's clear that the motivation behind the line of thinking presented here is a desire to understand the nature of general intelligence and its pursuit – not a desire to avoid testing our AGI software! Really, as AGI engineers, we would love to have a sensible rigorous way to test our intermediary progress toward AGI, so as to be able to pose convincing arguments to skeptics, funding sources, potential collaborators and so forth. Our motivation here is not a desire to avoid having the intermediate progress of our efforts measured, but rather a desire to explain the frustrating (but by now rather well-established) difficulty of creating such intermediate goals for human-level AGI in a meaningful way.

If we or someone else figures out a compelling way to measure partial progress toward AGI, we will celebrate the occasion. But it seems worth seriously considering the possibility that the difficulty in finding such a measure reflects fundamental properties of general intelligence.

From a practical CogPrime perspective, we are interested in a variety of evaluation and testing methods, including the "virtual preschool" approach mentioned briefly above and more extensively in later chapters. However, our focus will be on evaluation methods that give us meaningful information about CogPrime's progress, given our knowledge of how CogPrime works and our understanding of the underlying theory. We are unlikely to focus on the achievement of intermediate test results capable of convincing skeptics of the reality of our partial progress, because we have not yet seen any credible tests of this nature, and because we suspect the reasons for this lack may be rooted in deep properties of feasible general intelligence, such as tricky cognitive synergy.

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Chapter 9
General Intelligence in the Everyday Human World

9.1 Introduction

Intelligence is not just about what happens inside a system, but also about what happens outside that system, and how the system interacts with its environment. Real-world general intelligence is about intelligence *relative to some particular class of environments*, and human-like general intelligence is about intelligence relative to the particular class of environments that humans evolved in (which in recent millennia has included environments humans have created using their intelligence). In Chapter 2, we reviewed some specific capabilities characterizing human-like general intelligence; to connect these with the general theory of general intelligence from the last few chapters, we need to explain what aspects of human-relevant *environments* correspond to these human-like intelligent *capabilities*. We begin with aspects of the environment related to communication, which turn out to tie in closely with cognitive synergy. Then we turn to physical aspects of the environment, which we suspect also connect closely with various human cognitive capabilities. Finally we turn to physical aspects of the human body and their relevance to the human mind. In the following chapter we present a deeper, more abstract theoretical framework encompassing these ideas.

These ideas are of theoretical importance, and they're also of practical importance when one turns to the critical area of *AGI environment design*. If one is going to do anything besides release one's young AGI into the "wilds" of everyday human life, then one has to put some thought into what kind of environment it will be raised in. This may be a virtual world or it may be a robot preschool or some other kind of physical environment, but in any case some specific choices must be made about what to include. Specific choices must also be made about what kind of body to give one's AGI system – what sensors and actuators, and so forth. In Chapter 16 we will present some specific suggestions regarding choices of embodiment and environment that we find to be ideal for AGI development – virtual and robot preschools – but the material in this chapter is of more general import, beyond any such particularities. If one has an intuitive idea of what properties of body and world human intelligence is biased for, then one can make practical choices about embodiment and environment in a principled rather than purely ad hoc or opportunistic way.

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9.2 Some Broad Properties of the Everyday World That Help Structure Intelligence

The properties of the everyday world that help structure intelligence are diverse and span multiple levels of abstraction. Most of this chapter will focus on fairly concrete patterns of this nature, such as are involved in inter-agent communication and naive physics; however, it's also worth noting the potential importance of more abstract patterns distinguishing the everyday world from arbitrary mathematical environments.

The propensity to search for hierarchical patterns is one huge potential example of an abstract everyday-world property. We strongly suspect the reason that searching for hierarchical patterns works so well, in so many everyday-world contexts, lies in the particular structure of the everyday world – it's not something that would be true across all possible environments (even if one weights the space of possible environments in some clever way, say using program-length according to some standard computational model). However, this sort of assertion is of course highly "philosophical," and becomes complex to formulate and defend convincingly given the current state of science and mathematics.

Going one step further, we recall from Chapter 3 a structure called the "dual network", which consists of superposed hierarchical and heterarchical networks: basically a hierarchy in which the distance between two nodes in the hierarchy is correlated with the distance between the nodes in some metric space. Another high level property of the everyday world may be that dual network structures are prevalent. This would imply that minds biased to represent the world in terms of dual network structure are likely to be intelligent with respect to the everyday world.

In a different direction, the extreme commonality of symmetry groups in the (everyday and otherwise) physical world is another example: they occur so often that minds oriented toward recognizing patterns involving symmetry groups are likely to be intelligent with respect to the real world.

We suspect that the number of cognitively-relevant properties of the everyday world is huge ... and that the essence of everyday-world intelligence lies in the list of varyingly abstract and concrete properties, which must be embedded implicitly or explicitly in the structure of a natural or artificial intelligence for that system to have everyday-world intelligence.

Apart from these particular yet abstract properties of the everyday world, intelligence is just about "finding patterns in which actions tend to achieve which goals in which situations" ... but, the simple meta-algorithm needed to accomplish this universally is, we suggest, only a small percentage what it takes to make a mind.

You might say that a sufficiently generally intelligent system should be able to infer the various cognitively-relevant properties of the environment from looking at data about the everyday world. We agree *in principle*, and in fact Ben Kuipers and his colleagues have done some interesting work in this direction, showing that learning algorithms can infer some basics about the structure of space and time from experience [MK07]. But we suggest that doing this really thoroughly would require a massively greater amount of processing power than an AGI that embodies and hence automatically utilizes these principles. It may be that the problem of inferring these properties is so hard as to require a wildly infeasible $AIXI^{tl}$ / Godel Machine type system.

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9.3 Embodied Communication

Next we turn to the potential cognitive implications of seeking to achieve goals in an environment in which multimodal communication with other agents plays a prominent role.

Consider a community of embodied agents living in a shared world, and suppose that the agents can communicate with each other via a set of mechanisms including:

- **Linguistic communication**, in a language whose semantics is largely (not necessarily wholly) interpretable based on the mutually experienced world
- **Indicative communication**, in which e.g. one agent points to some part of the world or delimits some interval of time, and another agent is able to interpret the meaning
- **Demonstrative communication**, in which an agent carries out a set of actions in the world, and the other agent is able to imitate these actions, or instruct another agent as to how to imitate these actions
- **Depictive communication**, in which an agent creates some sort of (visual, auditory, etc.) construction to show another agent, with a goal of causing the other agent to experience phenomena similar to what they would experience upon experiencing some particular entity in the shared environment
- **Intentional communication**, in which an agent explicitly communicates to another agent what its goal is in a certain situation [1]

It is clear that ordinary everyday communication between humans possesses all these aspects.

We define the **Embodied Communication Prior** (ECP) as the probability distribution in which the probability of an entity (e.g. a goal or environment) is proportional to the difficulty of describing that entity, for a typical member of the community in question, using a particular set of communication mechanisms including the above five modes. We will sometimes refer to the prior probability of an entity under this distribution, as its "simplicity" under the distribution.

Next, to further specialize the Embodied Communication Prior, we will assume that for each of these modes of communication, there are some aspects of the world that are much more easily communicable using that mode than the other modes. For instance, in the human everyday world:

- Abstract (declarative) statements spanning large classes of situations are generally much easier to communicate linguistically
- Complex, multi-part procedures are much easier to communicate either demonstratively, or using a combination of demonstration with other modes
- Sensory or episodic data is often much easier to communicate demonstratively
- The current value of attending to some portion of the shared environment is often much easier to communicate indicatively
- Information about what goals to follow in a certain situation is often much easier to communicate intentionally, i.e. via explicitly indicating what one's own goal is

These simple observations have significant implications for the nature of the Embodied Communication Prior. For one thing they let us define multiple forms of knowledge:

- **Isolatedly declarative knowledge** is that which is much more easily communicable linguistically

[1] in Appendix **??** we recount some interesting recent results showing that mirror neurons fire in response to some cases of intentional communication as thus defined

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- **Isolatedly procedural knowledge** is that which is much more easily communicable demonstratively
- **Isolatedly sensory knowledge** is that which is much more easily communicable depictively
- **Isolatedly attentive knowledge** is that which is much more easily communicable indicatively
- **Isolatedly intentional knowledge** is that which is much more easily communicable intentionally

This categorization of knowledge types resembles many ideas from the cognitive theory of memory [TC05], although the distinctions drawn here are a little crisper than any classification currently derivable from available neurological or psychological data.

Of course there may be much knowledge, of relevance to systems seeking intelligence according to the ECP, that does not fall into any of these categories and constitutes "mixed knowledge." There are some very important specific subclasses of mixed knowledge. For instance, episodic knowledge (knowledge about specific real or hypothetical sets of events) will most easily be communicated via a combination of declarative, sensory and (in some cases) procedural communication. Scientific and mathematical knowledge are generally mixed knowledge, as is most everyday commonsense knowledge.

Some cases of mixed knowledge are reasonably well decomposable, in the sense that they decompose into knowledge items that individually fall into some specific knowledge type. For instance, an experimental chemistry procedure may be much more easily communicable procedurally, whereas an allied piece of knowledge from theoretical chemistry may be much more easily communicable declaratively; but in order to fully communicate either the experimental procedure or the abstract piece of knowledge, one may ultimately need to communicate both aspects.

Also, even when the best way to communicate something is mixed-mode, it may be possible to identify one mode that poses the most important part of the communication. An example would be a chemistry experiment that is best communicated via a practical demonstration together with a running narrative. It may be that the demonstration without the narrative would be vastly more valuable than the narrative without the demonstration. To cover such cases we may make less restrictive definitions such as

- **Interactively declarative knowledge** is that which is much more easily communicable in a manner dominated by linguistic communication

and so forth. We call these "interactive knowledge categories," by contrast to the "isolated knowledge categories" introduced earlier.

9.3.0.1 Naturalness of Knowledge Categories

Next we introduce an assumption we call NKC, for Naturalness of Knowledge Categories. The NKC assumption states that the knowledge in each of the above isolated and interactive communication-modality-focused categories forms a "natural category," in the sense that for each of these categories, there are many different properties shared by a large percentage of the knowledge in the category, but not by a large percentage of the knowledge in the other categories. This means that, for instance, procedural knowledge systematically (and statistically) has different characteristics than the other kinds of knowledge.

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The NKC assumption seems commonsensically to hold true for human everyday knowledge, and it has fairly dramatic implications for general intelligence. Suppose we conceive general intelligence as the ability to achieve goals in the environment shared by the communicating agents underlying the Embodied Communication Prior. Then, NKC suggests that the best way to achieve general intelligence according to the Embodied Communication Prior is going to involve

- specialized methods for handling declarative, procedural, sensory and attentional knowledge (due to the naturalness of the isolated knowledge categories)
- specialized methods for handling interactions between different types of knowledge, including methods focused on the case where one type of knowledge is primary and the others are supporting (the latter due to the naturalness of the interactive knowledge categories)

9.3.0.2 Cognitive Completeness

Suppose we conceive an AI system as consisting of a set of learning capabilities, each one characterized by three features:

- One or more **knowledge types** that it is competent to deal with, in the sense of the two key learning problems mentioned above
- At least one **learning type**: either analysis, or synthesis, or both
- At least one **interaction type**, for each (knowledge type, learning type) pair it handles: "isolated" (meaning it deals mainly with that knowledge type in isolation), or "interactive" (meaning it focuses on that knowledge type but in a way that explicitly incorporates other knowledge types into its process), or "fully mixed" (meaning that when it deals with the knowledge type in question, no particular knowledge type tends to dominate the learning process).

Then, intuitively, it seems to follow from the ECP with NKC that systems with high efficient general intelligence should have the following properties, which collectively we'll call **cognitive completeness**:

- For each (knowledge type, learning type, interaction type) triple, there should be a learning capability corresponding to that triple.
- Furthermore the capabilities corresponding to different (knowledge type, interaction type) pairs should have distinct characteristics (since according to the NKC the isolated knowledge corresponding to a knowledge type is a natural category, as is the dominant knowledge corresponding to a knowledge type)
- For each (knowledge type, learning type) pair (K,L), and each other knowledge type K1 distinct from K, there should be a distinctive capability with interaction type "interactive" and dealing with knowledge that is interactively K but also includes aspects of K1

Furthermore, it seems intuitively sensible that according to the ECP with NKC, if the capabilities mentioned in the above points are reasonably able, then the system possessing the capabilities will display general intelligence relative to the ECP. Thus we arrive at the hypothesis that

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Under the assumption of the Embodied Communication Prior (with the Natural Knowledge Categories assumption), the property above called "cognitive completeness" is necessary and sufficient for efficient general intelligence at the level of an inteligent adult human (e.g. at the Piagetan formal level [Pia53]).

Of course, the above considerations are very far from a rigorous mathematical proof (or even precise formulation) of this hypothesis. But we are presenting this here as a conceptual hypothesis, in order to qualitatively guide our practical AGI R&D and also to motivate further, more rigorous theoretical work.

9.3.1 Generalizing the Embodied Communication Prior

One interesting direction for further research would be to broaden the scope of the inquiry, in a manner suggested above: instead of just looking at the ECP, look at simplicity measures in general, and attack the question of how a mind must be structured in order to display efficient general intelligence relative to a specified simplicity measure. This problem seems unapproachable in general, but some special cases may be more tractable.

For instance, suppose one has

- a simplicity measure that (like the ECP) is approximately decomposable into a set of fairly distinct components, plus their interactions
- an assumption similar to NKC, which states that the entities displaying simplicity according to each of the distinct components, are roughly clustered together in entity-space

Then one should be able to say that, to achieve efficient general intelligence relative to this decomposable simplicity measure, a system should have distinct capabilities corresponding to each of the components of the simplicity measure interactions between these capabilities, corresponding to the interaction terms in the simplicity measure.

With copious additional work, these simple observations could potentially serve as the seed for a novel sort of theory of general intelligence – a theory of how the structure of a system depends on the structure of the simplicity measure with which it achieves efficient general intelligence. Cognitive Synergy Theory would then emerge as a special case of this more abstract theory.

9.4 Naive Physics

Multimodal communication is an important aspect of the environment for which human intelligence evolved – but not the only one. It seems likely that our human intelligence is also closely adapted to various aspects of our physical environment – a matter that is worth carefully attending as we design environments for our robotically or virtually embodied AGI systems to operate in.

One interesting guide to the most cognitively relevant aspects of human environments is the subfield of AI known as "naive physics" [Hay85] – a term that refers to the theories about the physical world that human beings implicitly develop and utilize during their lives. For instance,

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when you figure out that you need to pressure the knife slightly harder when spreading peanut butter rather than jelly, you're not making this judgment using Newtonian physics or the Navier-Stokes equations of fluid dynamics; you're using heuristic patterns that you figured out through experience. Maybe you figured out these patterns through experience spreading peanut butter and jelly in particular. Or maybe you figured these heuristic patterns out before you ever tried to spread peanut butter or jelly specifically, via just touching peanut butter and jelly to see what they feel like, and then carrying out inference based on your experience manipulating similar tools in the context of similar substances.

Other examples of similar "naive physics" patterns are easy to come by, e.g.

1. What goes up must come down.
2. A dropped object falls straight down.
3. A vacuum sucks things towards it.
4. Centrifugal force throws rotating things outwards.
5. An object is either at rest or moving, in an absolute sense.
6. Two events are simultaneous or they are not.
7. When running downhill, one must lift one's knees up high.
8. When looking at something that you just barely can't discern accurately, squint.

Attempts to axiomatically formulate naive physics have historically come up short, and we doubt this is a promising direction for AGI. However, we do think the naive physics literature does a good job of identifying the various phenomena that the human mind's naive physics deals with. So, from the point of view of AGI environment design, naive physics is a useful source of requirements. Ideally, we would like an AGI's environment to support all the fundamental phenomena that naive physics deals with.

We now describe some key aspects of naive physics in a more systematic manner. Naive physics has many different formulations; in this section we draw heavily on [SC94], who divide naive physics phenomena into 5 categories. Here we review these categories and identify a number of important things that humanlike intelligent agents must be able to do relative to each of them.

9.4.1 Objects, Natural Units and Natural Kinds

One key aspect of naive physics involves recognition of various aspects of objects, such as:

1. Recognition of objects amidst noisy perceptual data
2. Recognition of surfaces and interiors of objects
3. Recognition of objects as manipulable units
4. Recognition of objects as potential subjects of fragmentation (splitting, cutting) and of unification (gluing, bonding)
5. Recognition of the agent's body as an object, and as parts of the agent's body as objects
6. Division of universe of perceived objects into "natural kinds", each containing typical and atypical instances

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9.4.2 Events, Processes and Causality

Specific aspects of naive physics related to temporality and causality are:

1. Distinguishing roughly-subjectively-instantaneous events from extended processes
2. Identifying beginnings, endings and crossings of processes
3. Identifying and distinguishing internal and external changes
4. Identifying and distinguishing internal and external changes relative to one's own body
5. Interrelating body-changes with changes in external entities

Notably, these aspects of naive physics involve a different processes occurring on a variety of different time scales, intersecting in complex patterns, and involving processes inside the agent's body, outside the agent's body, and crossing the boundary of the agent's body.

9.4.3 Stuffs, States of Matter, Qualities

Regarding the various states of matter, some important aspects of naive physics are:

1. Perceiving gaps between objects: holes, media, illusions like rainbows, mirages and holograms
2. Distinguishing the manners in which different sorts of entities (e.g. smells, sounds, light) fill space
3. Distinguishing properties such as smoothness, roughness, graininess, stickiness, runniness, etc.
4. Distinguishing degrees of elasticity and fragility
5. Assessing separability of aggregates

9.4.4 Surfaces, Limits, Boundaries, Media

Gibson [Gib77, Gib79] has argued that naive physics is not mainly about objects but rather mainly about surfaces. Surfaces have a variety of aspects and relationships that are important for naive physics, such as:

1. Perceiving and reasoning about surfaces as two-sided or one-sided interfaces
2. Inference of the various ecological laws of surfaces
3. Perception of various media in the world as separated by surfaces
4. Recognition of the textures of surfaces
5. Recognition of medium/surface layout relationships such as: ground, open environment, enclosure, detached object, attached object, hollow object, place, sheet, fissure, stick, fibre, dihedral, etc.

As a concrete, evocative "toy" example of naive everyday knowledge about surfaces and boundaries, consider Sloman's [Slo08a] example scenario, depicted in Figure 9.1 and drawn largely from [SS74] (see also related discussion in [Slo08b], in which "A child can be given one

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Fig. 9.1: One of Sloman's example test domains for real-world inference. Left: a number of pins and a rubber band to be stretched around them. Right: use of the pins and rubber band to make a letter T.

or more rubber bands and a pile of pins, and asked to use the pins to hold the band in place to form a particular shape)... For example, things to be learnt could include":

1. There is an area inside the band and an area outside the band.
2. The possible effects of moving a pin that is inside the band towards or further away from other pins inside the band. (The effects can depend on whether the band is already stretched.)
3. The possible effects of moving a pin that is outside the band towards or further away from other pins inside the band.
4. The possible effects of adding a new pin, inside or outside the band, with or without pushing the band sideways with the pin first.
5. The possible effects of removing a pin, from a position inside or outside the band.
6. Patterns of motion/change that can occur and how they affect local and global shape (e.g. introducing a concavity or convexity, introducing or removing symmetry, increasing or decreasing the area enclosed).
7. The possibility of causing the band to cross over itself. (NB: Is an odd number of crosses possible?)
8. How adding a second, or third band can enrich the space of structures, processes and effects of processes.

9.4.5 What Kind of Physics Is Needed to Foster Human-like Intelligence?

We stated above that we would like an AGI's environment to support all the fundamental phenomena that naive physics deals with; and we have now reviewed a number of these specific phenomena. But it's not entirely clear what the "fundamental" aspects underlying these phenomena are. One important question in the environment-design context is how close an AGI environment needs to stick to the particulars of real-world naive physics. Is it important that a young AGI can play with the specific differences between spreading peanut butter versus jelly? Or is it enough that it can play with spreading and smearing various substances of different consistencies? How close does the analogy between an AGI environment's naive physics and

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real-world naive physics need to be? This is a question to which we have no scientific answer at present. Our own working hypothesis is that the analogy does not need to be extremely close, and with this in mind in Chapter 16 we propose a virtual environment BlocksNBeadsWorld that encompasses all the basic conceptual phenomena of real-world naive physics, but does not attempt to emulate their details.

Framed in terms of human psychology rather than environment design, the question becomes: *At what level of detail must one model the physical world to understand the ways in which human intelligence has adapted to the physical world?*. Our suspicion, which underlies our BlocksNBeadsWorld design, is that it's approximately enough to have

- Newtonian physics, or some close approximation
- Matter in multiple phases and forms vaguely similar to the ones we see in the real world: solid, liquid, gas, paste, goo, etc.
- Ability to transform some instances of matter from one form to another
- Ability to flexibly manipulate matter in various forms with various solid tools
- Ability to combine instances of matter into new ones in a fairly rich way: e.g. glue or tie solids togethermix liquids together, etc.
- Ability to position instances of matter with respect to each other in a rich way: e.g. put liquid in a solid cavity, cover something with a lid or a piece of fabric, etc.

It seems to us that if the above are present in an environment, then an AGI seeking to achieve appropriate goals in that environment will be likely to form an appropriate "human-like physical-world intuition." We doubt that the specifics of the naive physics of different forms of matter are critical to human-like intelligence. But, we suspect that a great amount of unconscious human metaphorical thinking is conditioned on the fact that humans evolved around matter that takes a variety of forms, can be changed from one form to another, and can be fairly easily arranged and composited to form new instances from prior ones. Without many diverse instances of matter transformation, arrangement and composition in its experience, an AGI is unlikely to form an internal "metaphor-base" even vaguely similar to the human one – so that, even if it's highly intelligent, its thinking will be radically non-human-like in character.

Naturally this is all somewhat speculative and must be explored via experimentation. Maybe an elaborate blocks-world with only solid objects will be sufficient to create human-level, roughly human-like AGI with rich spatiotemporal and manipulative intuition. Or maybe human intelligence is more closely adapted to the specifics of our physical world – with water and dirt and plants and hair and so forth – than we currently realize. One thing that *is* very clear is that, as we proceed with embodying, situating and educating our AGI systems, we need to pay careful attention to the way their intelligence is conditioned by their environment.

9.5 Folk Psychology

Related to naive physics is the notion of "naive psychology" or "folk psychology" [Rav04], which includes for instance the following aspects:

1. Mental simulation of other agents
2. Mental theory regarding other agents
3. Attribution of beliefs, desires and intentions (BDI) to other agents via theory or simulation

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4. Recognition of emotions in other agents via their physical embodiment
5. Recognition of desires and intentions in other agents via their physical embodiment
6. Analogical and contextual inferences between self and other, regarding BDI and other aspects
7. Attribute causes and meanings to other agents behaviors
8. Anthropomorphize non-human, including inanimate objects

The main special requirement placed on an AGI's embodiment by the above aspects pertains to the ability of agents to express their emotions and intentions to each other. Humans do this via facial expressions, gestures and language.

9.5.1 Motivation, Requiredness, Value

Relatedly to folk psychology, Gestalt [Koh38] and ecological [Gib77, Gib79] psychology suggest that humans perceive the world substantially in terms of the affordances it provides them for goal-directed action. This suggests that, to support human-like intelligence, an AGI must be capable of:

1. Perception of entities in the world as differentially associated with goal-relevant value
2. Perception of entities in the world in terms of the potential actions they afford the agent, or other agents

The key point is that entities in the world need to provide a wide variety of ways for agents to interact with them, enabling richly complex perception of affordances.

9.6 Body and Mind

The above discussion has focused on the world external to the body of the AGI agent embodied and embedded in the world, but the issue of the AGI's body also merits consideration. There seems little doubt that a human's intelligence is highly conditioned by the particularities of the human body.

9.6.1 The Human Sensorium

Here the requirements seem fairly simple: while surely not strictly necessary, it would certainly be *preferable* to provide an AGI with fairly rich analogues of the human senses of touch, sight, sound, kinesthesia, taste and smell. Each of these senses provides different sorts of cognitive stimulation to the human mind; and while similar cognitive stimulation could doubtless be achieved without analogous senses, the provision of such seems the most straightforward approach. It's hard to know how much of human intelligence is specifically biased to the sorts of outputs provided by human senses.

As vision already is accorded such a prominent role in the AI and cognitive science literature – and is discussed in moderate depth in Chapter 26 of Part 2, we won't take time elaborating

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on the importance of vision processing for humanlike cognition. The key thing an AGI requires to support humanlike "visual intelligence" is an environment containing a sufficiently robust collection of materials that object and event recognition and identification become interesting problems.

Audition is cognitively valuable for many reasons, one of which is that it gives a very rich and precise method of sensing the world that is different from vision. The fact that humans can display normal intelligence while totally blind or totally deaf is an indication that, in a sense, vision and audition are redundant for understanding the everyday world. However, it may be important that the brain has evolved to account for both of these senses, because this forced it to account for the presence of two very rich and precise methods of sensing the world – which may have forced it to develop more abstract representation mechanisms than would have been necessary with only one such method.

Touch is a sense that is, in our view, generally badly underappreciated within the AI community. In particular the cognitive robotics community seems to worry too little about the terribly impoverished sense of touch possessed by most current robots (though fortunately there are recent technologies that may help improve robots in this regard; see e.g. [Nan08]). Touch is how the human infant learns to distinguish self from other, and in this way it is the most essential sense for the establishment of an internal self-model. Touching others' bodies is a key method for developing a sense of the emotional reality and responsiveness of others, and is hence key to the development of theory of mind and social understanding in humans. For this reason, among others, human children lacking sufficient tactile stimulation will generally wind up badly impaired in multiple ways. A good-quality embodiment should supply an AI agent with a body that possesses skin, which has varying levels of sensitivity on different parts of the skin (so that it can effectively distinguish between reality and its perception thereof in a tactile context); and also varying types of touch sensors (e.g. temperature versus friction), so that it experiences textures as multidimensional entities.

Related to touch, kinesthesia refers to direct sensation of phenomena happening inside the body. Rarely mentioned in AI, this sense seems quite critical to cognition, as it underpins many of the analogies between self and other that guide cognition. Again, it's not important that an AGI's virtual body have the same internal body parts as a human body. But it seems valuable to have the AGI's virtual body display some vaguely human-body-like properties, such as feeling internal strain of various sorts after getting exercise, feeling discomfort in certain places when running out of energy, feeling internally different when satisfied versus unsatisfied, etc.

Next, taste is a cognitively interesting sense in that it involves the interplay between the internal and external world; it involves the evaluation of which entities from the external world are worthy of placing inside the body. And smell is cognitively interesting in large part because of its relationship with taste. A smell is, among other things, a long-distance indicator of what a certain entity might taste like. So, the combination of taste and smell provides means for conceptualizing relationships between self, world and distance.

9.6.2 The Human Body's Multiple Intelligences

While most unique aspect of human intelligence is rooted in what one might call the "cognitive cortex" – the portions of the brain dealing with self-reflection and abstract thought. But the cognitive cortex does its work in close coordination with the body's various more specialized

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intelligent subsystems, including those associated with the gut, the heart, the liver, the immune and endocrine systems, and the perceptual and motor cortices.

In the perspective underlying this book, the human cognitive cortex – or the core cognitive network of any roughly human-like AGI system – should be viewed as a highly flexible, self-organizing network. These cognitive networks are modelable e.g. as a recurrent neural net with general topology, or a weighted labeled hypergraph, and are centrally concerned with recognizing patterns in its environment and itself, especially patterns regarding the achievement of the system's goals in various appropriate contexts. Here we augment this perspective, noting that the human brain's cognitive network is closely coupled with a variety of simpler and more specialized intelligent "body-system networks" which provide it with structural and dynamical inductive biasing. We then discuss the implications of this observation for practical AGI design.

One recalls Pascal's famous quote "The heart has its reasons, of which reason knows not." As we now know, the intuitive sense that Pascal and so many others have expressed, that the heart and other body systems have their own reasons, is grounded in the fact that they actually do carry out simple forms of reasoning (i.e. intelligent, adaptive dynamics), in close, sometimes cognitively valuable, coordination with the central cognitive network.

9.6.2.1 Some of the Human Body's Specialized Intelligent Subsystems

The human body contains multiple specialized intelligences apart from the cognitive cortex. Here we review some of the most critical.

Hierarchies of Visual and Auditory Perception

. The hierarchical structure of visual and auditory cortex has been taken by some researchers [Kur12], [HB06] as the generic structure of cognition. While we suspect this is overstated, we agree it is important that these cortices nudge large portions of the cognitive cortex to assume an approximately hierarchical structure.

Olfactory Attractors

. The process of recognizing a familiar smell is grounded in a neural process similar to convergence to an attractor in a nonlinear dynamical system [Fre95]. There is evidence that the mammalian cognitive cortex evolved in close coordination with the olfactory cortex [Row11], and much of abstract cognition reflects a similar dynamic of gradually coming to a conclusion based on what initially "smells right."

Physical and Cognitive Action

. The cerebellum, a specially structured brain subsystem which controls motor movements, has for some time been understood to also have involvement in attention, executive control, language, working memory, learning, pain, emotion, and addiction [PSF09].

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The Second Brain

. The gastrointestinal neural net contains millions of neurons and is capable of operating independently of the brain. It modulates stress response and other aspects of emotion and motivation based on experience – resulting in so-called "gut feelings" [Ger99].

The Heart's Neural Network

. The heart has its own neural network, which modulates stress response, energy level and relaxation/excitement (factors key to motivation and emotion) based on experience [Arm04].

Pattern Recognition and Memory in the Liver

. The liver is a complex pattern recognition system, adapting via experience to better identify toxins [CB06]. Like the heart, it seems to store some episodic memories as well, resulting in liver transplant recipients sometimes acquiring the tastes in music or sports of the donor [EMC12].

Immune Intelligence

. The immune network is a highly complex, adaptive self-organizing system, which ongoingly solves the learning problem of identifying antigens and distinguishing them from the body system [FP86]. As immune function is highly energetically costly, stress response involves subtle modulation of the energy allocation to immune function, which involves communication between neural and immune networks.

The Endocrine System: A Key Bridge Between Mind and Body

. The endocrine (hormonal) system regulates (and is related by) emotion, thus guiding all aspects of intelligence (due to the close connection of emotion and motivation) [PH12].

Breathing Guides Thinking

. As oxygenation of the brain plays a key role in the spread of neural activity, the flow of breath is a key driver of cognition. Forced alternate nostril breathing has been shown to significantly affect cognition via balancing activity of the two brain hemispheres [SKBB91].

Much remains unknown, and the totality of feedback loops between the human cognitive cortex and the various specialized intelligences operative throughout the human body, has not yet been thoroughly charted.

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9.6.2.2 Implications for AGI

What lesson should the AGI developer draw from all this? The particularities of the human mind/body should not be taken as general requirements for general intelligence. However, it is worth remembering just how difficult is the computational problem of learning, based on experiential feedback alone, the right way to achieve the complex goal of controlling a system with general intelligence at the human level or beyond. To solve this problem without some sort of strong inductive biasing may require massively more experience than young humans obtain.

Appropriate inductive bias may be embedded in an AGI system in many different ways. Some AGI designers have sought to embed it very explicitly, e.g. with hand-coded declarative knowledge as in Cyc, SOAR and other "GOFAI" type systems. On the other hand, the human brain receives its inductive bias much more subtly and implicitly, both via the specifics of the initial structure of the cognitive cortex, and via ongoing coupling of the cognitive cortex with other systems possessing more focused types of intelligence and more specific structures and/or dynamics.

In building an AGI system, one has four choices, very broadly speaking:

1. Create a flexible mind-network, as unbiased as feasible, and attempt to have it learn how to achieve its goals via experience
2. Closely emulate key aspects of the human body along with the human mind
3. Imitate the human mind-body, conceptually if not in detail, and create a number of structurally and dynamically simpler intelligent systems closely and appropriately coupled to the abstract cognitive mind-network, provide useful inductive bias.
4. Find some other, creative way to guide and probabilistically constrain one's AGI system's mind-network, providing inductive bias appropriate to the tasks at hand, without emulating even conceptually the way the human mind-brain receives its inductive bias via coupling with simpler intelligent systems.

Our suspicion is that the first option will not be viable. On the other hand, to do the second option would require more knowledge of the human body than biology currently possesses. This leaves the third and fourth options, both of which seem viable to us.

CogPrime incorporates a combination of the third and fourth options. CogPrime's generic dynamic knowledge store, the Atomspace, is coupled with specialized hierarchical networks (DeSTIN) for vision and audition, somewhat mirroring the human cortex. An artificial endocrine system for OpenCog is also under development, speculatively, as part of a project using OpenCog to control humanoid robots. On the other hand, OpenCog has no gastrointestinal nor cardiological nervous system, and the stress-response-based guidance provided to the human brain by a combination of the heart, gut, immune system and other body systems, is achieved in CogPrime in a more explicit way using the OpenPsi model of motivated cognition, and its integration with the system's attention allocation dynamics.

Likely there is no single correct way to incorporate the lessons of intelligent human body-system networks into AGI designs. But these are aspects of human cognition that all AGI researchers should be aware of.

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9.7 The Extended Mind and Body

Finally, Hutchins [Hut95], Logan [Log07] and others have promoted a view of human intelligence that views the human mind as extended beyond the individual body, incorporating social interactions and also interactions with inanimate objects, such as tools, plants and animals. This leads to a number of requirements for a humanlike AGI's environment:

1. The ability to create a variety of different tools for interacting with various aspects of the world in various different ways, including tools for making tools and ultimately machinery
2. The existence of other mobile, virtual life-forms in the world, including simpler and less intelligent ones, and ones that interact with each other and with the AGI
3. The existence of organic growing structures in the world, with which the AGI can interact in various ways, including halting their growth or modifying their growth pattern

How necessary these requirements are is hard to say – but it *is* clear that these things have played a major role in the evolution of human intelligence.

9.8 Conclusion

Happily, this diverse chapter supports a simple, albeit tentative conclusion. Our suggestion is that, if an AGI is

- placed in an environment capable of roughly supporting multimodal communication and vaguely (but not necessarily precisely) real-world-ish naive physics
- surrounded with other intelligent agents of varying levels of complexity, and other complex, dynamic structures to interface with
- given a body that can perceive this environment through some forms of sight, sound and touch; and perceive itself via some form of kinesthesia
- given a motivational system that encourages it to make rich use of these aspects of its environment

then the AGI is likely to have an experience-base reinforcing the key inductive biases provided by the everyday world for the guidance of humanlike intelligence.

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Chapter 10
A Mind-World Correspondence Principle

10.1 Introduction

Real-world minds are always adapted to certain classes of environments and goals. The ideas of the previous chapter, regarding the connection between a human-like intelligence's internals and its environment, result from exploring the implications of this adaptation in the context of the cognitive synergy concept. In this chapter we explore the mind-world connection in a broader and more abstract way – making a more ambitious attempt to move toward a "general theory of general intelligence."

One basic premise here, as in the preceding chapters is: Even a system of vast general intelligence, subject to real-world space and time constraints, will necessarily be more efficient at some kinds of learning than others. Thus, one approach to formulating a general theory of general intelligence is to look at the relationship between minds and worlds – where a "world" is conceived as an environment and a set of goals defined in terms of that environment.

In this spirit, we here formulate a broad principle binding together worlds and the minds that are intelligent in these worlds. The ideas of the previous chapter constitute specific, concrete instantiations of this general principle. A careful statement of the principle requires introduction of a number of technical concepts, and will be given later on in the chapter. A crude, informal version of the principle would be:

MIND-WORLD CORRESPONDENCE-PRINCIPLE

For a mind to work intelligently toward certain goals in a certain world, there should be a nice mapping from goal-directed sequences of world-states into sequences of mind-states, where "nice" means that a world-state-sequence W composed of two parts W_1 and W_2, gets mapped into a mind-state-sequence M composed of two corresponding parts M_1 and M_2.

What's nice about this principle is that it relates the decomposition of the world into parts, to the decomposition of the mind into parts.

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10.2 What Might a General Theory of General Intelligence Look Like?

It's not clear, at this point, what a real "general theory of general intelligence" would look like – but one tantalizing possibility is that it might confront the two questions:

- How does one design a world to foster the development of a certain sort of mind?
- How does one design a mind to match the particular challenges posed by a certain sort of world?

One way to achieve this would be to create a theory that, given a description of an environment and some associated goals, would output a description of the structure and dynamics that a system should possess to be intelligent in that environment relative to those goals, using limited computational resources.

Such a theory would serve a different purpose from the mathematical theory of "universal intelligence" developed by Marcus Hutter [Hut05] and others. For all its beauty and theoretical power, that approach currently gives it useful conclusions only about general intelligences with infinite or infeasibly massive computational resources. On the other hand, the approach suggested here is aimed toward creation of a theory of real-world general intelligences utilizing realistic amounts of computational power, but still possessing general intelligence comparable to human beings or greater.

This reflects a vision of intelligence as largely concerned with adaptation to particular classes of environments and goals. This may seem contradictory to the notion of "general" intelligence, but I think it actually embodies a realistic understanding of general intelligence. Maximally general intelligence is not pragmatically feasible; it could only be achieved using infinite computational resources [Hut05]. Real-world systems are inevitably limited in the intelligence they can display in any real situation, because real situations involve finite resources, including finite amounts of time. One may say that, in principle, a certain system could solve any problem given enough resources and time but, even when this is true, it's not necessarily the most interesting way to look at the system's intelligence. It may be more important to look at what a system can do given the resources at its disposal in reality. And this perspective leads one to ask questions like the ones posed above: which bounded-resources systems are well-disposed to display intelligence in which classes of situations?

As noted in Chapter 7 above, one can assess the generality of a system's intelligence via looking at the entropy of the class of situations across which it displays a high level of intelligence (where "high" is measured relative to its total level of intelligence across all situations). A system with a high generality of intelligence will tend to be roughly equally intelligent across a wide variety of situations; whereas a system with lower generality of intelligence will tend to be much more intelligent in a small subclass of situations, than in any other. The definitions given above embody this notion in a formal and quantitative way.

If one wishes to create a general theory of general intelligence according to this sort of perspective, the main question then becomes how to represent goals/environments and systems in such a way as to render transparent the natural correspondence between the specifics of the former and the latter, in the context of resource-bounded intelligence. This is the business of the next section.

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10.3 Steps Toward A (Formal) General Theory of General Intelligence

Now begins the formalism. At this stage of development of the theory proposed in this chapter, mathematics is used mainly as a device to ensure clarity of expression. However, once the theory is further developed, it may possibly become useful for purposes of calculation as well.

Suppose one has any system S (which could be an AI system, or a human, or an environment that a human or AI is interacting with, or the combination of an environment and a human or AI's body, etc.). One may then construct an uncertain transition graph associated with that system S, in the following way:

- The nodes of the graph represent fuzzy sets of states of system S (I'll call these state-sets from here on, leaving the fuzziness implicit)
- The (directed) links of the graph represent probabilistically weighted transitions between state-sets

Specifically, the weight of the link from B to A should be defined as

$$P(o(S, A, t(T))|o(S, B, T))$$

where

$$o(S, A, T)$$

denotes the presence of the system S in the state-set A during time-distribution T, and $t()$ is a temporal succession function defined so that $t(T)$ refers to a time-distribution conceived as "after" T. A time-distribution is a probability distribution over time-points. The interaction of fuzziness and probability here is fairly straightforward and may be handled in the manner of PLN, as outlined in subsequent chapters. Note that the definition of link weights is dependent on the specific implementation of the temporal succession function, which includes an implicit time-scale.

Suppose one has a transition graph corresponding to an environment; then a goal relative to that environment may be defined as a particular node in the transition graph. The goals of a particular system acting in that environment may then be conceived as one or more nodes in the transition graph. The system's situation in the environment at any point in time may also be associated with one or more nodes in the transition graph; then, the system's movement toward goal-achievement may be associated with paths through the environment's transition graph leading from its current state to goal states.

It may be useful for some purposes to filter the uncertain transition graph into a crisp transition graph by placing a threshold on the link weights, and removing links with weights below the threshold.

The next concept to introduce is the world-mind transfer function, which maps world (environment) state-sets into organism (e.g. AI system) state-sets in a specific way. Given a world state-set W, the world-mind transfer function M maps W into various organism state-sets with various probabilities, so that we may say: $M(W)$ is the probability distribution of state-sets the organism tends to be in, when its environment is in state-set W. (Recall also that state-sets are fuzzy.)

Now one may look at the spaces of world-paths and mind-paths. A world-path is a path through the world's transition graph, and a mind-path is a path through the organism's transi-

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tion graph. Given two world-paths P and Q, it's obvious how to define the composition $P*Q$ one follows P and then, after that, follows Q, thus obtaining a longer path. Similarly for mind-paths.

In category theory terms, we are constructing the free category associated with the graph: the objects of the category are the nodes, and the morphisms of the category are the paths. And category theory is the right way to be thinking here we want to be thinking about the relationship between the world category and the mind category.

The world-mind transfer function can be interpreted as a mapping from paths to subgraphs: Given a world-path, it produces a set of mind state-sets, which have a number of links between them. One can then define a world-mind path transfer function $M(P)$ via taking the mind-graph $M(nodes(P))$, and looking at the highest-weight path spanning $M(nodes(P))$. (Here $nodes$? obviously means the set of nodes of the path P.)

A functor F between the world category and the mind category is a mapping that preserves object identities and so that

$$F(P * Q) = F(P) * F(Q)$$

We may also introduce the notion of an approximate functor, meaning a mapping F so that the average of

$$d(F(P * Q), F(P) * F(Q))$$

is small.

One can introduce a prior distribution into the average here. This could be the Levin universal distribution or some variant (the Levin distribution assigns higher probability to computationally simpler entities). Or it could be something more purpose specific: for example, one can give a higher weight to paths leading toward a certain set of nodes (e.g. goal nodes). Or one can use a distribution that weights based on a combination of simplicity and directedness toward a certain set of nodes. The latter seems most interesting, and I will define a goal-weighted approximate functor as an approximate functor, defined with averaging relative to a distribution that balances simplicity with directedness toward a certain set of goal nodes.

The move to approximate functors is simple conceptually, but mathematically it's a fairly big step, because it requires us to introduce a geometric structure on our categories. But there are plenty of natural metrics defined on paths in graphs (weighted or not), so there's no real problem here.

10.4 The Mind-World Correspondence Principle

Now we finally have the formalism set up to make a non-trivial statement about the relationship between minds and worlds. Namely, the hypothesis that:

MIND-WORLD CORRESPONDENCE PRINCIPLE

For an organism with a reasonably high level of intelligence in a certain world, relative to a certain set of goals, the mind-world path transfer function is a goal-weighted approximate functor.

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That is, a little more loosely: the hypothesis is that, for intelligence to occur, there has to be a natural correspondence between the transition-sequences of world-states and the corresponding transition-sequences of mind-states, at least in the cases of transition-sequences leading to relevant goals.

We suspect that a variant of the above proposition can be formally proved, using the definition of general intelligence presented in Chapter 7. The proof of a theorem corresponding to the above would certainly constitute an interesting start toward a general formal theory of general intelligence. Note that proving anything of this nature would require some attention to the time-scale-dependence of the link weights in the transition graphs involved.

A formally proved variant of the above proposition would be in short, a "MIND-WORLD CORRESPONDENCE THEOREM."

Recall that at the start of the chapter, we expressed the same idea as:

MIND-WORLD CORRESPONDENCE-PRINCIPLE

For a mind to work intelligently toward certain goals in a certain world, there should be a nice mapping from goal-directed sequences of world-states into sequences of mind-states, where "nice" means that a world-state-sequence W composed of two parts W_1 and W_2, gets mapped into a mind-state-sequence M composed of two corresponding parts M_1 and M_2.

That is a reasonable gloss of the principle, but it's clunkier and less accurate, than the statement in terms of functors and path transfer functions, because it tries to use only common-language vocabulary, which doesn't really contain all the needed concepts.

10.5 How Might the Mind-World Correspondence Principle Be Useful?

Suppose one believes the Mind-World Correspondence Principle as laid out above so what?

Our hope, obviously, is that the principle could be useful in actually figuring out how to architect intelligent systems biased toward particular sorts of environment. And of course, this is said with the understanding that any finite intelligence must be biased toward some sorts of environment.

Relatedly, given a specific AGI design (such as CogPrime), one could use the principle to figure out which environments it would be best suited for. Or one could figure out how to adjust the particulars of the design, to maximize the system's intelligence in the environments of interest.

One next step in developing this network of ideas, aside from (and potentially building on) full formalization of the principle, would be an exploration of real-world environments in terms of transition graphs. What properties do the transition graphs induced from the real world have?

One such property, we suggest, is successive refinement. Often the path toward a goal involves first gaining an approximate understanding of a situation, then a slightly more accurate understanding, and so forth – until finally one has achieved a detailed enough understanding to actually achieve the goal. This would be represented by a world-path whose nodes are state-sets involving the gathering of progressively more detailed information.

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Via pursuing to the mind-world correspondence property in this context, I believe we will find that world-paths reflecting successive refinement correspond to mind-paths embodying successive refinement. This will be found to relate to the hierarchical structures found so frequently in both the physical world and the human mind-brain. Hierarchical structures allow many relevant goals to be approached via successive refinement, which I believe is the ultimate reason why hierarchical structures are so common in the human mind-brain.

Another next step would be exploring what mind-world correspondence means for the structure and dynamics of a limited-resources intelligence. If an organism O has limited resources and, to be intelligent, needs to make

$$P(o(O, M(A), t(T))|o(O, M(B), T))$$

high for particular world state-sets A and B, then what's the organism's best approach? Arguably, it should represent $M(A)$ and $M(B)$ internally in such a way that very little computational effort is required for it to transition between $M(A)$ and $M(B)$. For instance, this could be done by coding its knowledge in such a way that $M(A)$ and $M(B)$ share many common bits; or it could be done in other more complicated ways.

If, for instance, A is a subset of B, then it may prove beneficial for the organism to represent $M(A)$ physically as a subset of its representation of $M(B)$.

Pursuing this line of thinking, one could likely derive specific properties of an intelligent organism's internal information-flow, from properties of the environment and goals with respect to which it's supposed to be intelligent.

This would allow us to achieve the holy grail of intelligence theory as I understand it: given a description of an environment and goals, to be able to derive an architectural description for an organism that will display a high level of intelligence relative to those goals, given limited computational resources.

While this "holy grail" is obviously a far way off, what we've tried to do here is to outline a clear mathematical and conceptual direction for moving toward it.

10.6 Conclusion

The Mind-World Correspondence Principle presented here – if in the vicinity of correctness – constitutes a non-trivial step toward fleshing out the concept of a general theory of general intelligence. But obviously the theory is still rather abstract, and also not completely rigorous. There's a lot more work to be done.

The Mind-World Correspondence Principle as articulated above is not quite a formal mathematical statement. It would take a little work to put in all the needed quantifiers to formulate it as one, and it's not clear the best way to do so the details would perhaps become clear in the course of trying to prove a version of it rigorously. One could interpret the ideas presented in this chapter as a philosophical theory that hopes to be turned into a mathematical theory and to play a key role in a scientific theory.

For the time being, the main role to be served by these ideas is qualitative: to help us think about concrete AGI designs like CogPrime in a sensible way. It's important to understand what the goal of a real-world AGI system needs to be: to achieve the ability to broadly learn and generalize, yes, but not with infinite capability rather with biases and patterns that are implicitly and/or explicitly tuned to certain broad classes of goals and environments. The Mind-World

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Correspondence Principle tells us something about what this "tuning" should involve – namely, making a system possessing mind-state sequences that correspond meaningfully to world-state sequences. CogPrime's overall design and particular cognitive processes are reasonably well interpreted as an attempt to achieve this for everyday human goals and environments.

One way of extending these theoretical ideas into a more rigorous theory is explored in Appendix **??**. The key ideas involved there are: modeling multiple memory types as mathematical categories (with functors mapping between them), modeling memory items as probability distributions, and measuring distance between memory items using two metrics, one based on algorithmic information theory and one on classical information geometry. Building on these ideas, core hypotheses are then presented:

- a **syntax-semantics correlation** principle, stating that in a successful AGI system, these two metrics should be roughly correlated
- a **cognitive geometrodynamics** principle, stating that on the whole intelligent minds tend to follow geodesics (shortest paths) in mindspace, according to various appropriately defined metrics (e.g. the metric measuring the distance between two entities in terms of the length and/or runtime of the shortest programs computing one from the other).
- a **cognitive synergy** principle, stating that shorter paths may be found through the composite mindspace formed by considering multiple memory types together, than by following the geodesics in the mindspaces corresponding to individual memory types.

The material is relegated to an appendix because it is so speculative, and it's not yet clear whether it will really be useful in advancing or interpreting CogPrime or other AGI systems (unlike the material from the present chapter, which has at least been useful in interpreting and tweaking the CogPrime design, even though it can't be claimed that CogPrime was derived directly from these theoretical ideas). However, this sort of speculative exploration is, in our view, exactly the sort of thing that's needed as a first phase in transitioning the ideas of the present chapter into a more powerful and directly actionable theory.

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Section III
Cognitive and Ethical Development

Chapter 11
Stages of Cognitive Development

Co-authored with Stephan Vladimir Bugaj

11.1 Introduction

Creating AGI, we have said, is not only about having the right structural and dynamical possibilities implemented in the initial version of one's system – but also about the environment and embodiment that one's system is associated with, and the match between the system's internals and these externals. Another key aspect is the long-term time-course of the system's evolution over time, both in its internals and its external interaction – i.e., what is known as *development*.

Development is a critical topic in our approach to AGI because we believe that much of what constitutes human-level, human-like intelligence *emerges* in an intelligent system due to its engagement with its environment and its environment-coupled self-organization. So, it's not to be expected that the initial version of an AGI system is going to display impressive feats of intelligence, even if the engineering is totally done right. A good analogy is the apparent unintelligence of a human baby. Yes, scientists have discovered that human babies are capable of interesting and significant intelligence – but one has to hunt to find it ... at first observation, babies are rather idiotic and simple-minded creatures: much less intelligent-appearing than lizards or fish, maybe even less than cockroaches....

If the goal of an AGI project is to create an AGI system that can progressively develop advanced intelligence through learning in an environment richly populated with other agents and various inanimate stimuli and interactive entities – then an understanding of the nature of cognitive development becomes extremely important to that project.

Unfortunately, contemporary cognitive science contains essentially no theory of "abstract developmental psychology" which can conveniently be applied to understand developing AIs. There is of course an extensive science of **human** developmental psychology, and so it is a natural research program to take the chief ideas from the former and inasmuch as possible port them to the AGI domain. This is not an entirely simple matter both because of the differences between humans and AIs and because of the unsettled nature of contemporary developmental psychology theory. But it's a job that must (and will) be done, and the ideas in this chapter may contribute toward this effort.

We will begin here with Piaget's well-known theory of human cognitive development, presenting it in a general systems theory context, then introducing some modifications and extensions and discussing some other relevant work.

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11.2 Piagetan Stages in the Context of a General Systems Theory of Development

Our review of AGI architectures in Chapter 4 focused heavily on the concept of **symbolism**, and the different ways in which different classes of cognitive architecture handle symbol representation and manipulation. We also feel that symbolism is critical to the notion of AGI development – and even more broadly, to the systems theory of development in general.

As a broad conceptual perspective on development, we suggest that one may view the development of a complex information processing system, embedded in an environment, in terms of the stages:

- **automatic**: the system interacts with the environment by "instinct", according to its innate programming
- **adaptive**: the system internally adapts to the environment, then interacting with the environment in a more appropriate way
- **symbolic**: the system creates internal symbolic representations of itself and the environment, which in the case of a complex, appropriately structured environment, allows it to interact with the environment more intelligently
- **reflexive**: the system creates internal symbolic representations of its own internal symbolic representations, thus achieving an even higher degree of intelligence

Sketched so broadly, these are not precisely defined categories but rather heuristic, intuitive categories. Formalizing them would be possible but would lead us too far astray here.

One can interpret these stages in a variety of different contexts. Here our focus is the cognitive development of humans and human-like AGI systems, but in Table 11.1 we present them in a slightly more general context, using two examples: the Piagetan example of the human (or humanlike) mind as it develops from infancy to maturity; and also the example of the "origin of life" and the development of life from proto-life up into its modern form. In any event, we allude to this more general perspective on development here mainly to indicate our view that the Piagetan perspective is not something ad hoc and arbitrary, but rather can plausibly be seen as a specific manifestation of more fundamental principles of complex systems development.

11.3 Piaget's Theory of Cognitive Development

The ghost of Jean Piaget hangs over modern developmental psychology in a yet unresolved way. Piaget's theories provide a cogent overarching perspective on human cognitive development, coordinating broad theoretical ideas and diverse experimental results into a unified whole [Pia55]. Modern experimental work has shown Piaget's ideas to be often oversimplified and incorrect. However, what has replaced the Piagetan understanding is not an alternative unified and coherent theory, but a variety of microtheories addressing particular aspects of cognitive development. For this reason a number of contemporary theorists taking a computer science [Shu03] or dynamical systems [Wit07] approach to developmental psychology have chosen to adopt the Piagetan framework in spite of its demonstrated shortcomings, both because of its conceptual strengths and for lack of a coherent, more rigorously grounded alternative.

Our own position is that the Piagetan view of development has some fundamental truth to it, which is reflected via how nicely it fits with a broader view of development in complex systems.

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Stage	General Description	Cognitive Development	Origin of Life
Automatic	System-environment information exchange controlled mainly by innate system structures or environment	Piagetan infantile stage	Self-organizing protolife system, e.g. Oparin [Opa52] water droplet, or Cairns-Smith [CS90] clay-based protolife
Adaptive	System-environment info exchange heavily guided by adaptively internally-created system structures	Piagetan "concrete operational" stage: systematic internal world-model guides world-exploration	Simple autopoietic system, e.g. Oparin water droplet w/ basic metabolism
Symbolic	Internal symbolic representation of information exchange process	Piagetan formal stage: explicit logical/experimental learning about how to cognize in various contexts	Genetic code: internal entities that "stand for" aspects of organism and environment, thus enabling complex epigenesis
Reflexive	Thoroughgoing self-modification based on this symbolic representation	Piagetan post-formal stage: purposive self-modification of basic mental processes	Genes+memes: genetic code-patterns guide their own modification via influencing culture

Table 11.1: General Systems Theory of Development: Parallels Between Development of Mind and Origin of Life

Indeed, Piaget viewed developmental stages as emerging from general "algebraic" principles rather than as being artifacts of the particulars of human psychology. But, Piaget's stages are probably best viewed as a general interpretive framework rather than a precise scientific theory. Our suspicion is that once the empirical science of developmental psychology has progressed further, it will become clearer how to fit the various data into a broad Piaget-like framework, perhaps differing in many details from what Piaget described in his works.

Piaget conceived of child development in four stages, each roughly identified with an age group, and corresponding closely to the system-theoretic stages mentioned above:

- **infantile**, corresponding to the automatic stage mentioned above
  - *Example:* Grasping blocks, piling blocks on top of each other, copying words that are heard
- **preoperational** and **concrete operational**, corresponding to the adaptive stage mentioned above
  - *Example:* Building complex blocks structures, from imagination and from imitating objects and pictures and based on verbal instructions; verbally describing what has been constructed
- **formal**, corresponding to the symbolic stage mentioned above
  - *Example:* Writing detailed instructions in words and diagrams, explaining how to construct particular structures out of blocks; figuring out general rules describing which sorts of blocks structures are likely to be most stable

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- the reflexive stage mentioned above corresponds to what some post-Piagetan theorists have called the **post-formal** stage
  - *Example:* Using abstract lessons learned from building structures out of blocks to guide the construction of new ways to think and understand – "Zen and the art of blocks building" (by analogy to *Zen and the Art of Motorcycle Maintenance* [Pir84]).

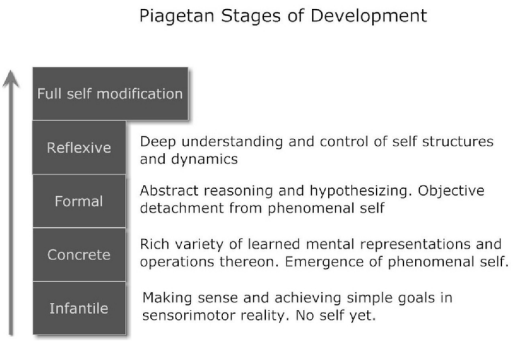

Fig. 11.1: Piagetan Stages of Cognitive Development

More explicitly, Piaget defined his stages in psychological terms roughly as follows:

- **Infantile**: In this stage a mind develops basic world-exploration driven by instinctive actions. Reward-driven reinforcement of actions learned by imitation, simple associations between words and objects, actions and images, and the basic notions of time, space, and causality are developed. The most simple, practical ideas and strategies for action are learned.
- **Preoperational**: At this stage we see the formation of mental representations, mostly poorly organized and un-abstracted, building mainly on intuitive rather than logical thinking. Word-object and image-object associations become systematic rather than occasional. Simple syntax is mastered, including an understanding of subject-argument relationships. One of the crucial learning achievements here is "object permanence" – infants learn that objects persist even when not observed. However, a number of cognitive failings persist with respect to reasoning about logical operations, and abstracting the effects of intuitive actions to an abstract theory of operations.
- **Concrete**: More abstract logical thought is applied to the physical world at this stage. Among the feats achieved here are: reversibility – the ability to undo steps already done; conservation – understanding that properties can persist in spite of appearances; theory of mind – an understanding of the distinction between what I know and what others know (If

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I cover my eyes, can you still see me?). Complex concrete operations, such as putting items in height order, are easily achievable. Classification becomes more sophisticated, yet the mind still cannot master purely logical operations based on abstract logical representations of the observational world.

- **Formal**: Abstract deductive reasoning, the process of forming, then testing hypotheses, and systematically reevaluating and refining solutions, develops at this stage, as does the ability to reason about purely abstract concepts without reference to concrete physical objects. This is adult human-level intelligence. Note that the capability for formal operations is intrinsic in the PLN component of CogPrime, but in-principle capability is not the same as pragmatic, grounded, controllable capability.

Very early on, Vygotsky [Vyg86] disagreed with Piaget's explanation of his stages as inherent and developed by the child's own activities, and Piaget's prescription of good parenting as not interfering with a child's unfettered exploration of the world. Some modern theorists have critiqued Piaget's stages as being insufficiently socially grounded, and these criticisms trace back to Vygotsky's focus on the social foundations of intelligence, on the fact that children function in a world surrounded by adults who provide a cultural context, offering ongoing assistance, critique, and ultimately validation of the child's developmental activities.

Vygotsky also was an early critic of the idea that cognitive development is continuous, and continues beyond Piaget's formal stage. Gagne [RBW92] also believes in continuity, and that learning of prerequisite skills made the learning of subsequent skills easier and faster without regard to Piagetan stage formalisms. Subsequent researchers have argued that Piaget has merely constructed ad hoc descriptions of the sequential development of behaviour [Gib78, Bro84, CP05]. We agree that learning is a continuous process, and our notion of stages is more statistically constructed than rigidly quantized.

Critique of Piaget's notion of transitional "half stages" is also relevant to a more comprehensive hierarchical view of development. Some have proposed that Piaget's half stages are actually stages [Bro84]. As Commons and Pekker [CP05] point out: "the definition of a stage that was being used by Piaget was based on analyzing behaviors and attempting to impose different structures on them. There is no underlying logical or mathematical definition to help in this process ..." Their Hierarchical Complexity development model uses task achievement rather than ad hoc stage definition as the basis for constructing relationships between phases of developmental ability – an approach which we find useful, though our approach is different in that we define stages in terms of specific underlying cognitive mechanisms.

Another critique of Piaget is that one individual's performance is often at different ability stages depending on the specific task (for example [GE86]). Piaget responded to early critiques along these lines by calling the phenomenon "horizontal décalage," but neither he nor his successors [Fis80, Cas85] have modified his theory to explain (rather than merely describe) it. Similarly to Thelen and Smith [TS94], we observe that the abilities encapsulated in the definition of a certain stage emerge gradually during the previous stage – so that the onset of a given stage represents the mastery of a cognitive skill that was previously present only in certain contexts.

Piaget also had difficulty accepting the idea of a preheuristic stage, early in the infantile period, in which simple trial-and-error learning occurs without significant heuristic guidance [Bic88], a stage which we suspect exists and allows formulation of heuristics by aggregation of learning from preheuristic pattern mining. Coupled with his belief that a mind's innate abilities at birth are extremely limited, there is a troublingly unexplained transition from inability to ability in his model.

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Finally, another limiting aspect of Piaget's model is that it did not recognize any stages beyond formal operations, and included no provisions for exploring this possibility. A number of researchers [Bic88, Arl75, CRK82, Rie73, Mar01] have described one or more postformal stages. Commons and colleagues have also proposed a task-based model which provides a framework for explaining stage discrepancies across tasks and for generating new stages based on classification of observed logical behaviors. [KK90] promotes a statistical conception of stage, which provides a good bridge between task-based and stage-based models of development, as statistical modeling allows for stages to be roughly defined and analyzed based on collections of task behaviors.

[CRK82] postulates the existence of a postformal stage by observing *elevated levels of abstraction* which, they argue, are not manifested in formal thought. [CTS+98] observes a postformal stage when subjects become capable of analyzing and coordinating complex logical systems with each other, creating metatheoretical supersystems. In our model, with the reflexive stage of development, we expand this definition of metasystemic thinking to include the ability to consciously refine one's own mental states and formalisms of thinking. Such self-reflexive refinement is necessary for learning which would allow a mind to analytically devise entirely new structures and methodologies for both formal and postformal thinking.

In spite of these various critiques and limitations, however, we have found Piaget's ideas very useful, and in Section 11.4 we will explore ways of defining them rigorously in the specific context of CogPrime's declarative knowledge store and probabilistic logic engine.

11.3.1 Perry's Stages

Also relevant is William Perry's [Per70, Per81] theory of the stages ("positions" in his terminology) of intellectual and ethical development, which constitutes a model of iterative refinement of approach in the developmental process of coming to intellectual and ethical maturity. These stages, depicted in Table 11.2 form an analytical tool for discerning the modality of belief of an intelligence by describing common cognitive approaches to handling the complexities of real world ethical considerations.

11.3.2 Keeping Continuity in Mind

Continuity of mental stages, and the fact that a mind may appear to be in multiple stages of development simultaneously (depending upon the tasks being tested), are crucial to our theoretical formulations and we will touch upon them again here. Piaget attempted to address continuity with the creation of transitional "half stages". We prefer to observe that each stage feeds into the other and the end of one stage and the beginning of the next blend together.

The distinction between formal and post-formal, for example, seems to "merely" be the application of formal thought to oneself. However, the distinction between concrete and formal is "merely" the buildup to higher levels of complexity of the classification, task decomposition, and abstraction capabilities of the concrete stage. The stages represent general trends in ability on a continuous curve of development, not discrete states of mind which are jumped-into quantum style after enough "knowledge energy" builds-up to cause the transition.

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Stage	Substages
Dualism / Received Knowledge [Infantile]	Basic duality ("All problems are solvable. I must learn the correct solutions.") Full dualism ("There are different, contradictory solutions to many problems. I must learn the correct solutions, and ignore the incorrect ones")
Multiplicity [Concrete]	Early multiplicity ("Some solutions are known, others aren't. I must learn how to find correct solutions.") Late Multiplicity: cognitive dissonance regarding truth. ("Some problems are unsolvable, some are a matter of personal taste, therefore I must declare my own intellectual path.")
Relativism / Procedural Knowledge [Formal]	Contextual Relativism ("I must learn to evaluate solutions within a context, and relative to supporting observation.") Pre-Commitment ("I must evaluate solutions, then commit to a choice of solution.")
Commitment / Constructed Knowledge [Formal / Reflexive]	Commitment ("I have chosen a solution.") Challenges to Commitment ("I have seen unexpected implications of my commitment, and the responsibility I must take.") Post-Commitment ("I must have an ongoing, nuanced relationship to the subject in which I evaluate each situation on a case-by-case basis with respects to its particulars rather than an ad-hoc application of unchallenged ideology.")

Table 11.2: Perry's Developmental Stages [with corresponding Piagetan Stages in brackets]

Observationally, this appears to be the case in humans. People learn things gradually, and show a continuous development in ability, not a quick jump from ignorance to mastery. We believe that this gradual development of ability is the signature of genuine learning, and that prescriptively an AGI system must be designed in order to have continuous and asymmetrical development across a variety of tasks in order to be considered a genuine learning system. While quantum leaps in ability may be possible in an AGI system which can just "graft" new parts of brain onto itself (or an augmented human which may someday be able to do the same using implants), such acquisition of knowledge is not really learning. Grafting on knowledge does not build the cognitive pathways needed in order to actually learn. If this is the only mechanism available to an AGI system to acquire new knowledge, then it is not really a learning system.

11.4 Piaget's Stages in the Context of Uncertain Inference

Piaget's developmental stages are very general, referring to overall types of learning, not specific mechanisms or methods. This focus was natural since the context of his work was *human* developmental psychology, and neuroscience has not yet progressed to the point of understanding the neural mechanisms underlying any sort of inference (and certainly was nowhere near to doing so in Piaget's time!). But if one is studying developmental psychology in an AGI context where one knows something about the internal mechanisms of the AGI system under consideration, then one can work with a more specific model of learning. Our focus here is on AGI systems whose operations contain uncertain inference as a central component. Obviously the main focus is CogPrime, but the essential ideas apply to any other uncertain inference centric AGI architecture as well.

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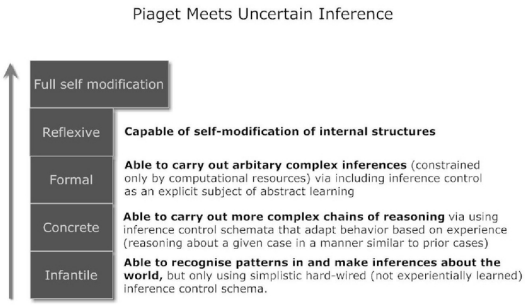

Fig. 11.2: Piagetan Stages of Development, as Manifested in the Context of Uncertain Inference

An uncertain inference system, as we consider it here, consists of four components, which work together in a feedback-control loop 11.3

1. a content representation scheme
2. an uncertainty representation scheme
3. a set of inference rules
4. a set of inference control schemata

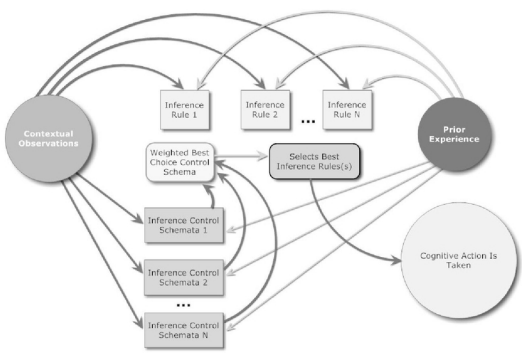

Fig. 11.3: A Simplified Look at Feedback-Control in Uncertain Inference

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Broadly speaking, examples of content representation schemes are predicate logic and term logic [ES00]. Examples of uncertainty representation schemes are fuzzy logic [Zad78], imprecise probability theory [Goo86, FC86], Dempster-Shafer theory [Sha76, Kyb97], Bayesian probability theory [Kyb97], NARS [Wan95], and the Atom representation used in CogPrime, briefly alluded to in Chapter 6 above and described in depth in later chapters.

Many, but not all, approaches to uncertain inference involve only a limited, weak set of inference rules (e.g. not dealing with complex quantified expressions). CogPrime's PLN inference framework, like NARS and some other uncertain inference frameworks, contains uncertain inference rules that apply to logical constructs of arbitrary complexity. Only a system capable of dealing with constructs of arbitrary (or at least very high) complexity will have any potential of leading to human-level, human-like intelligence.

The subtlest part of uncertain inference is inference control: the choice of which inferences to do, in what order. Inference control is the primary area in which human inference currently exceeds automated inference. Humans are not very efficient or accurate at carrying out inference rules, with or without uncertainty, but we are very good at determining which inferences to do and in what order, in any given context. The lack of effective, context-sensitive inference control heuristics is why the general ability of current automated theorem provers is considerably weaker than that of a mediocre university mathematics major [Mac95].

We now review the Piagetan developmental stages from the perspective of AGI systems heavily based on uncertain inference.

11.4.1 The Infantile Stage

In this initial stage, the mind is able to recognize patterns in and conduct inferences about the world, but only using simplistic hard-wired (not experientially learned) inference control schema, along with pre-heuristic pattern mining of experiential data.

In the infantile stage an entity is able to recognize patterns in and conduct inferences about its sensory surround context (i.e., it's "world"), but only using simplistic, hard-wired (not experientially learned) inference control schemata. Preheuristic pattern-mining of experiential data is performed in order to build future heuristics about analysis of and interaction with the world.

s tasks include:

1. Exploratory behavior in which useful and useless / dangerous behavior is differentiated by both trial and error observation, and by parental guidance.
2. Development of "habits" – i.e. Repeating tasks which were successful once to determine if they always / usually are so.
3. Simple goal-oriented behavior such as "find out what cat hair tastes like" in which one must plan and take several sequentially dependent steps in order to achieve the goal.

Inference control is very simple during the infantile stage (Figure 11.4), as it is the stage during which both the most basic knowledge of the world is acquired, and the most basic of cognition and inference control structures are developed as the building block upon which will be built the next stages of both knowledge and inference control.

Another example of a cognitive task at the borderline between infantile and concrete cognition is learning object permanence, a problem discussed in the context of CogPrime's predecessor "Novamente Cognition Engine" system in [GPSL03]. Another example is the learning of

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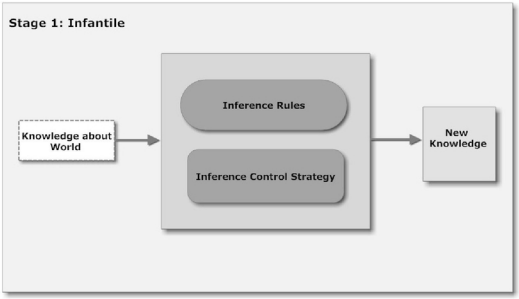

Fig. 11.4: Uncertain Inference in the Infantile Stage

word-object associations: e.g. learning that when the word "ball" is uttered in various contexts ("Get me the ball," "That's a nice ball," etc.) it generally refers to a certain type of object. The key point regarding these "infantile" inference problems, from the CogPrime perspective, is that assuming one provides the inference system with an appropriate set of perceptual and motor ConceptNodes and SchemaNodes, the chains of inference involved are short. They involve about a dozen inferences, and this means that the search tree of possible PLN inference rules walked by the PLN backward-chainer is relatively shallow. Sophisticated inference control is not required: standard AI heuristics are sufficient.

In short, textbook narrow-AI reasoning methods, utilized with appropriate uncertainty-savvy truth value formulas and coupled with appropriate representations of perceptual and motor inputs and outputs, correspond roughly to Piaget's infantile stage of cognition. The simplistic approach of these narrow-AI methods may be viewed as a method of creating building blocks for subsequent, more sophisticated heuristics.

In our theory Piaget's preoperational phase appears as transitional between the infantile and concrete operational phases.

11.4.2 The Concrete Stage

At this stage, the mind is able to carry out more complex chains of reasoning regarding the world, via using inference control schemata that adapt behavior based on experience (reasoning about a given case in a manner similar to prior cases).

In the concrete operational stage (Figure 11.5), an entity is able to carry out more complex chains of reasoning about the world. Inference control schemata which adapt behavior based on experience, using experientially learned heuristics (including those learned in the prior stage), are applied to both analysis of and interaction with the sensory surround / world.

Concrete Operational stage tasks include:

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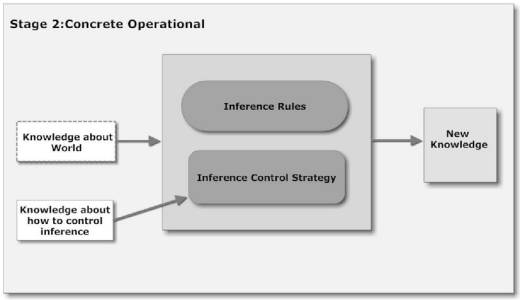

Fig. 11.5: Uncertain Inference in the Concrete Operational Stage

1. Conservation tasks, such as conservation of number,
2. Decomposition of complex tasks into easier subtasks, allowing increasingly complex tasks to be approached by association with more easily understood (and previously experienced) smaller tasks,
3. Classification and Serialization tasks, in which the mind can cognitively distinguish various disambiguation criteria and group or order objects accordingly.

In terms of inference control this is the stage in which actual knowledge about how to control inference itself is first explored. This means an emerging understanding of inference itself as a cognitive task and methods for learning, which will be further developed in the following stages.

Also, in this stage a special cognitive task capability is gained: "Theory of Mind," which in cognitive science refers to the ability to understand the fact that not only oneself, but other sentient beings have memories, perceptions, and experiences. This is the ability to conceptually "put oneself in another's shoes" (even if you happen to assume incorrectly about them by doing so).

11.4.2.1 Conservation of Number

Conservation of number is an example of a learning problem classically categorized within Piaget's concrete-operational phase, a "conservation laws" problem, discussed in [Shu03] in the context of software that solves the problem using (logic-based and neural net) narrow-AI techniques. Conservation laws are very important to cognitive development.

Conservation is the idea that a quantity remains the same despite changes in appearance. If you show a child some objects and then spread them out, an infantile mind will focus on the spread, and believe that there are now more objects than before, whereas a concrete-operational mind will understand that the quantity of objects has not changed.

Conservation of number seems very simple, but from a developmental perspective it is actually rather difficult. "Solutions" like those given in [Shu03] that use neural networks or cus-

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tomized logical rule-bases to find specialized solutions that solve only this problem fail to fully address the issue, because these solutions don't create knowledge adequate to aid with the solution of related sorts of problems.

We hypothesize that this problem is hard enough that for an inference-based AGI system to solve it in a developmentally useful way, its inferences must be guided by meta-inferential lessons learned from prior similar problems. When approaching a number conservation problem, for example, a reasoning system might draw upon past experience with set-size problems (which may be trial-and-error experience). This is not a simple "machine learning" approach whose scope is restricted to the current problem, but rather a heuristically guided approach which (a) aggregates information from prior experience to guide solution formulation for the problem at hand, and (b) adds the present experience to the set of relevant information about quantification problems for future refinement of thinking.

Fig. 11.6: Conservation of Number

For instance, a very simple context-specific heuristic that a system might learn would be: "When evaluating the truth value of a statement related to the number of objects in a set, it is generally not that useful to explore branches of the backwards-chaining search tree that contain relationships regarding the sizes, masses, or other physical properties of the objects in the set." This heuristic itself may go a long way toward guiding an inference process toward a correct solution to the problem–but it is not something that a mind needs to know "a priori." A concrete-operational stage mind may learn this by data-mining prior instances of inferences involving sizes of sets. Without such experience-based heuristics, the search tree for such a problem will likely be unacceptably large. Even if it is "solvable" without such heuristics, the solutions found may be overly fit to the particular problem and not usefully generalizable.

11.4.2.2 Theory of Mind

Consider this experiment: a preoperational child is shown her favorite "Dora the Explorer" DVD box. Asked what show she's about to see, she'll answer "Dora." However, when her parent plays the disc, it's "SpongeBob SquarePants." If you then ask her what show her friend will expect when given the "Dora" DVD box, she will respond "SpongeBob" although she just answered "Dora" for herself. A child lacking a theory of mind can not reason through what someone else would think given knowledge other than her own current knowledge. Knowledge of self is intrinsically related to the ability to differentiate oneself from others, and this ability may not be fully developed at birth.

Several theorists [BC94, Fod94], based in part on experimental work with autistic children, perceive theory of mind as embodied in an innate module of the mind activated at a certain developmental stage (or not, if damaged). While we consider this possible, we caution against adopting a simplistic view of the "innate vs. acquired" dichotomy: if there is innateness it may take the form of an innate predisposition to certain sorts of learning [EBJ+97].

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Davidson [Dav84], Dennett [Den87] and others support the common belief that theory of mind is dependent upon linguistic ability. A major challenge to this prevailing philosophical stance came from Premack and Woodruff [PW78] who postulated that prelinguistic primates do indeed exhibit "theory of mind" behavior. While Premack and Woodruff's experiment itself has been challenged, their general result has been bolstered by follow-up work showing similar results such as [TC97]. It seems to us that while theory of mind depends on many of the same inferential capabilities as language learning, it is not intrinsically dependent on the latter.

There is a school of thought often called the *Theory Theory* [BW88, Car85, Wel90] holding that a child's understanding of mind is best understood in terms of the process of iteratively formulating and refuting a series of naive theories about others. Alternately, Gordon [Gor86] postulates that theory of mind is related to the ability to run cognitive simulations of others' minds using one's own mind as a model. We suggest that these two approaches are actually quite harmonious with one another. In an uncertain AGI context, both theories and simulations are grounded in collections of uncertain implications, which may be assembled in context-appropriate ways to form theoretical conclusions or to drive simulations. Even if there is a special "mind-simulator" dynamic in the human brain that carries out simulations of other minds in a manner fundamentally different from explicit inferential theorizing, the inputs to and the behavior of this simulator may take inferential form, so that the simulator is in essence a way of efficiently and implicitly producing uncertain inferential conclusions from uncertain premises.

We have thought through the details by CogPrime system should be able to develop theory of mind via embodied experience, though at time of writing practical learning experiments in this direction have not yet been done. We have not yet explored in detail the possibility of giving CogPrime a special, elaborately engineered "mind-simulator" component, though this would be possible; instead we have initially been pursuing a more purely inferential approach.

First, it is very simple for a CogPrime system to learn patterns such as "If I rotated by pi radians, I would see the yellow block." And it's not a big leap for PLN to go from this to the recognition that "You look like me, and you're rotated by pi radians relative to my orientation, therefore you probably see the yellow block." The only nontrivial aspect here is the "you look like me" premise.

Recognizing "embodied agent" as a category, however, is a problem fairly similar to recognizing "block" or "insect" or "daisy" as a category. Since the CogPrime agent can perceive most parts of its own "robot" body–its arms, its legs, etc.–it should be easy for the agent to figure out that physical objects like these look different depending upon its distance from them and its angle of observation. From this it should not be that difficult for the agent to understand that it is naturally grouped together with other embodied agents (like its teacher), not with blocks or bugs.

The only other major ingredient needed to enable theory of mind is "reflection"– the ability of the system to explicitly recognize the existence of knowledge in its own mind (note that this term "reflection" is not the same as our proposed "reflexive" stage of cognitive development). This exists automatically in CogPrime, via the built-in vocabulary of elementary procedures supplied for use within SchemaNodes (specifically, the atTime and TruthValue operators). Observing that "at time T, the weight of evidence of the link L increased from zero" is basically equivalent to observing that the link L was created at time T.

Then, the system may reason, for example, as follows (using a combination of several PLN rules including the above-given deduction rule):

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Implication
My eye is facing a block and it is not dark
A relationship is created describing the block's color
Similarity
My body
My teacher's body
|-
Implication
My teacher's eye is facing a block and it is not dark
A relationship is created describing the block's color

This sort of inference is the essence of Piagetan "theory of mind." Note that in both of these implications the created relationship is represented as a variable rather than a specific relationship. The cognitive leap is that in the latter case the relationship actually exists in the teacher's implicitly hypothesized mind, rather than in CogPrime's mind. No explicit hypothesis or model of the teacher's mind need be created in order to form this implication–the hypothesis is created implicitly via inferential abstraction. Yet, a collection of implications of this nature may be used via an uncertain reasoning system like PLN to create theories and simulations suitable to guide complex inferences about other minds.

From the perspective of developmental stages, the key point here is that in a CogPrime context this sort of inference is too complex to be viably carried out via simple inference heuristics. This particular example must be done via forward chaining, since the big leap is to actually think of forming the implication that concludes inference. But there are simply too many combinations of relationships involving CogPrime's eye, body, and so forth for the PLN component to viably explore all of them via standard forward-chaining heuristics. Experience-guided heuristics are needed, such as the heuristic that if physical objects A and B are generally physically and functionally similar, and there is a relationship involving some part of A and some physical object R, it may be useful to look for similar relationships involving an analogous part of B and objects similar to R. This kind of heuristic may be learned by experience–and the masterful deployment of such heuristics to guide inference is what we hypothesize to characterize the concrete stage of development. The "concreteness" comes from the fact that inference control is guided by analogies to prior similar situations.

11.4.3 The Formal Stage

In the formal stage, as shown in Figure 11.7, an agent should be able to carry out arbitrarily complex inferences (constrained only by computational resources, rather than by fundamental restrictions on logical language or form) via including inference control as an explicit subject of abstract learning. Abstraction and inference about both the sensorimotor surround (world) and about abstract ideals themselves (including the final stages of indirect learning about inference itself) are fully developed.

Formal stage evaluation tasks are centered entirely around abstraction and higher-order inference tasks such as:

1. Mathematics and other formalizations.

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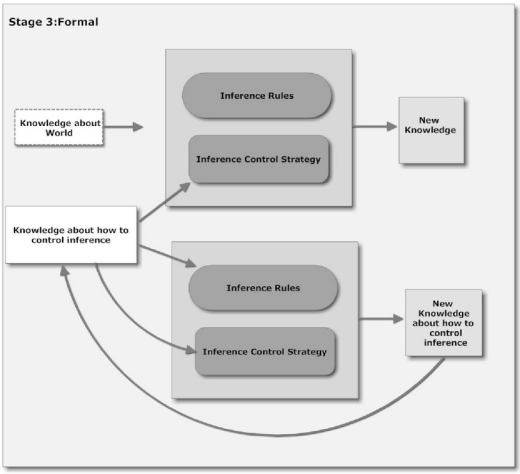

Fig. 11.7: Uncertain Inference in the Formal Stage

2. Scientific experimentation and other rigorous observational testing of abstract formalizations.
3. Social and philosophical modeling, and other advanced applications of empathy and the Theory of Mind.

In terms of inference control this stage sees not just perception of new knowledge about inference control itself, but inference controlled reasoning about that knowledge and the creation of abstract formalizations about inference control which are reasoned-upon, tested, and verified or debunked.

11.4.3.1 Systematic Experimentation

The Piagetan formal phase is a particularly subtle one from the perspective of uncertain inference. In a sense, AGI inference engines already have strong capability for formal reasoning built in. Ironically, however, no existing inference engine is capable of deploying its reasoning rules in a powerfully effective way, and this is because of the lack of inference control heuristics adequate for controlling abstract formal reasoning. These heuristics are what arise during Piaget's formal stage, and we propose that in the content of uncertain inference systems, they involve the application of inference itself to the problem of refining inference control.

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A problem commonly used to illustrate the difference between the Piagetan concrete operational and formal stages is that of figuring out the rules for making pendulums swing quickly versus slowly [IP58]. If you ask a child in the formal stage to solve this problem, she may proceed to do a number of experiments, e.g. build a long string with a light weight, a long string with a heavy weight, a short string with a light weight and a short string with a heavy weight. Through these experiments she may determine that a short string leads to a fast swing, a long string leads to a slow swing, and the weight doesn't matter at all.

The role of experiments like this, which test "extreme cases," is to make cognition easier. The formal-stage mind tries to map a concrete situation onto a maximally simple and manipulable set of abstract propositions, and then reason based on these. Doing this, however, requires an automated and instinctive understanding of the reasoning process itself. The above-described experiments are good ones for solving the pendulum problem because they provide data that is very easy to reason about. From the perspective of uncertain inference systems, this is the key characteristic of the formal stage: formal cognition approaches problems in a way explicitly calculated to yield tractable inferences.

Note that this is quite different from saying that formal cognition involves abstractions and advanced logic. In an uncertain logic-based AGI system, even infantile cognition may involve these – the difference lies in the level of inference control, which in the infantile stage is simplistic and hard-wired, but in the formal stage is based on an understanding of what sorts of inputs lead to tractable inference in a given context.

11.4.4 The Reflexive Stage

In the reflexive stage (Figure 11.8), an intelligent agent is broadly capable of self-modifying its internal structures and dynamics.

As an example in the human domain: highly intelligent and self-aware adult humans may carry out reflexive cognition by explicitly reflecting upon their own inference processes and trying to improve them. An example is the intelligent improvement of uncertain-truth-value-manipulation formulas. It is well demonstrated that even educated humans typically make numerous errors in probabilistic reasoning [GGK02]. Most people don't realize it and continue to systematically make these errors throughout their lives. However, a small percentage of individuals make an explicit effort to increase their accuracy in making probabilistic judgments by consciously endeavoring to internalize the rules of probabilistic inference into their automated cognition processes.

In the uncertain inference based AGI context, what this means is: In the reflexive stage an entity is able to include inference control itself as an explicit subject of abstract learning (i.e. the ability to reason about one's own tactical and strategic approach to modifying one's own learning and thinking), and modify these inference control strategies based on analysis of experience with various cognitive approaches.

Ultimately, the entity can self-modify its internal cognitive structures. Any knowledge or heuristics can be revised, including metatheoretical and metasystemic thought itself. Initially this is done indirectly, but at least in the case of AGI systems it is theoretically possible to also do so directly. This might be considered as a separate stage of Full Self Modification, or else as the end phase of the reflexive stage. In the context of logical reasoning, self modification of inference control itself is the primary task in this stage. In terms of inference control this

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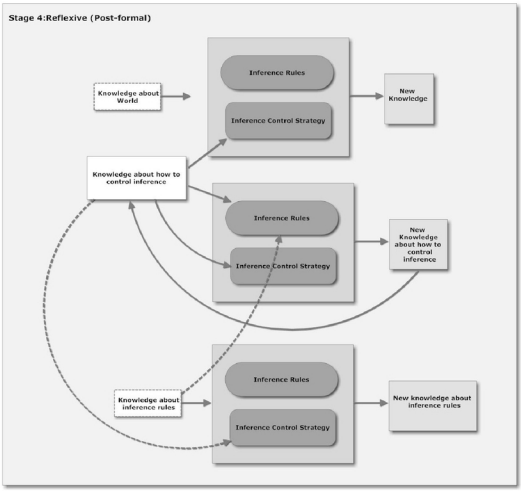

Fig. 11.8: The Reflexive Stage

stage adds an entire new feedback loop for reasoning about inference control itself, as shown in Figure 11.8.

As a very concrete example, in later chapters we will see that, while PLN is founded on probability theory, it also contains a variety of heuristic assumptions that inevitably introduce a certain amount of error into its inferences. For example, PLN's probabilistic deduction embodies a heuristic independence assumption. Thus PLN contains an alternate deduction formula called the "concept geometry formula" that is better in some contexts, based on the assumption that ConceptNodes embody concepts that are roughly spherically-shaped in attribute space. A highly advanced CogPrime system could potentially augment the independence-based and concept-geometry-based deduction formulas with additional formulas of its own derivation, optimized to minimize error in various contexts. This is a simple and straightforward example of reflexive cognition – it illustrates the power accessible to a cognitive system that has formalized and reflected upon its own inference processes, and that possesses at least some capability to modify these.

In general, AGI systems can be expected to have much broader and deeper capabilities for self-modification than human beings. Ultimately it may make sense to view the AGI systems we implement as merely "initial conditions" for ongoing self-modification and self-organization. Chapter **??** discusses some of the potential technical details underlying this sort of thorough-going AGI self-modification.

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Chapter 12
The Engineering and Development of Ethics

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12.1 Introduction

Most commonly, if a work on advanced AI mentions ethics at all, it occurs in a final summary chapter, discussing in broad terms some of the possible implications of the technical ideas presented beforehand. It's no coincidence that the order is reversed here: in the case of CogPrime, AGI-ethics considerations played a major role in the design process ... and thus the chapter on ethics occurs near the beginning rather than the end. In the CogPrime approach, ethics is not a particularly distinct topic, being richly interwoven with cognition and education and other aspects of the AGI project.

The ethics of advanced AGI is a complex issue with multiple aspects. Among the many issues there are:

1. Risks posed by the possibility of human beings using AGI systems for evil ends
2. Risks posed by AGI systems created without well-defined ethical systems
3. Risks posed by AGI systems with initially well-defined and sensible ethical systems eventually going rogue – an especially big risk if these systems are more generally intelligent than humans, and possess the capability to modify their own source code
4. the ethics of experimenting on AGI systems when one doesn't understand the nature of their experience
5. AGI rights: in what circumstances does using an AGI as a tool or servant constitute "slavery"

In this chapter we will focus mainly (though not exclusively) on the question of *how to create an AGI with a rational and beneficial ethical system.* After a somewhat wide-ranging discussion, we will conclude with eight general points that we believe should be followed in working toward "Friendly AGI" – most of which have to do, not with the internal design of the AGI, but with the way the AGI is taught and interfaced with the real world.

While most of the particulars discussed in this book have nothing to do with ethics, it's important for the reader to understand that AGI-ethics considerations have played a major role in many of our design decisions, underlying much of the technical contents of the book. As the materials in this chapter should make clear, ethicalness is probably not something that one can meaningfully tack onto an AGI system at the end, after developing the rest – it is likely infeasible to architect an intelligent agent and then add on an "ethics module." Rather, ethics is something that has to do with all the different memory systems and cognitive processes that

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constitute an intelligent system – and it's something that involves both cognitive architecture *and* the exploration a system does and the instruction it receives. It's a very complex matter that is richly intermixed with all the other aspects of intelligence, and here we will treat it as such.

12.2 Review of Current Thinking on the Risks of AGI

Before proceeding to outline our own perspective on AGI ethics in the context of CogPrime, we will review the main existing strains of thought on the potential ethical dangers associated with AGI. One science fiction film after another has highlighted these dangers, lodging the issue deep in our cultural awareness; unsurprisingly, much less attention has been paid to serious analysis of the risks in their various dimensions, but there is still a non-trivial literature worth paying attention to.

Hypothetically, an AGI with superhuman intelligence and capability could dispense with humanity altogether – i.e. posing an "existential risk" [Bos02]. In the worst case, an evil but brilliant AGI, perhaps programmed by a human sadist, could consign humanity to unimaginable tortures (i.e. realizing a modern version of the medieval Christian visions of hell). On the other hand, the potential benefits of powerful AGI also go literally beyond human imagination. It seems quite plausible that an AGI with massively superhuman intelligence and positive disposition toward humanity could provide us with truly dramatic benefits, such as a virtual end to material scarcity, disease and aging. Advanced AGI could also help individual humans grow in a variety of directions, including directions leading beyond "legacy humanity," according to their own taste and choice.

Eliezer Yudkowsky has introduced the term "Friendly AI", to refer to advanced AGI systems that act with human benefit in mind [Yud06]. Exactly what this means has not been specified precisely, though informal interpretations abound. Goertzel [Goe06b] has sought to clarify the notion in terms of three core values of Joy, Growth and Freedom. In this view, a Friendly AI would be one that advocates individual and collective human joy and growth, while respecting the autonomy of human choices.

Some (for example, Hugo de Garis, [DG05]), have argued that Friendly AI is essentially an impossibility, in the sense that the odds of a dramatically superhumanly intelligent mind worrying about human benefit are vanishingly small. If this is the case, then the best options for the human race would presumably be to either avoid advanced AGI development altogether, or to else fuse with AGI before it gets too strongly superhuman, so that beings-originated-as-humans can enjoy the benefits of greater intelligence and capability (albeit at cost of sacrificing their humanity).

Others (e.g. Mark Waser [Was09]) have argued that Friendly AI is essentially inevitable, because greater intelligence correlates with greater morality. Evidence from evolutionary and human history is adduced in favor of this point, along with more abstract arguments.

Yudkowsky [Yud06] has discussed the possibility of creating AGI architectures that are in some sense "provably Friendly" – either mathematically, or else at least via very tight lines of rational verbal argumentation. However, several issues have been raised with this approach. First, it seems likely that proving mathematical results of this nature would first require dramatic advances in multiple branches of mathematics. Second, such a proof would require a formalization of the goal of "Friendliness," which is a subtler matter than it might seem [Leg06b, Leg06a].

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Formalization of human morality has vexed moral philosophers for quite some time. Finally, it is unclear the extent to which such a proof could be created in a generic, environment-independent way – but if the proof depends on properties of the physical environment, then it would require a formalization of the environment itself, which runs up against various problems such as the complexity of the physical world and also the fact that we currently have no complete, consistent theory of physics. Kaj Sotala has provided a list of 14 objections to the Friendly AI concept, and suggested answers to each of them [Sot11]. Stephen Omohundro [Omo08] has argued that any advanced AI system will very likely demonstrate certain "basic AI drives", such as desiring to be rational, to self-protect, to acquire resources, and to preserve and protect its utility function and avoid counterfeit utility; these drives, he suggests, must be taken carefully into account in formulating approaches to Friendly AI.

The problem of formally or at least very carefully defining the goal of Friendliness has been considered from a variety of perspectives, none showing dramatic success. Yudkowsky [Yud04] has suggested the concept of "Coherent Extrapolated Volition", which roughly refers to the extrapolation of the common values of the human race. Many subtleties arise in specifying this concept – e.g. if Bob Jones is often possessed by a strong desire to kill all Martians, but he deeply aspires to be a nonviolent person, then the CEV approach would not rate "killing Martians" as part of Bob's contribution to the CEV of humanity.

Goertzel [Goe10a] has proposed a related notion of Coherent Aggregated Volition (CAV), which eschews the subtleties of extrapolation, and simply seeks a reasonably *compact, coherent, consistent* set of values that is fairly close to the collective value-set of humanity. In the CAV approach, "killing Martians" would be removed from humanity's collective value-set because it's uncommon and not part of the most compact/coherent/consistent overall model of human values, rather than because of Bob Jones' aspiration to nonviolence.

One thought we have recently entertained is that the core concept underlying CAV might be better thought of as CBV or "Coherent Blended Volition." CAV seems to be easily misinterpreted as meaning the average of different views, which was not the original intention. The CBV terminology clarifies that the CBV of a diverse group of people should not be thought of as an average of their perspectives, but as something more analogous to a "conceptual blend" [FT02] – incorporating the most essential elements of their divergent views into a whole that is overall compact, elegant and harmonious. The subtlety here (to which we shall return below) is that for a CBV blend to be broadly acceptable, the different parties whose views are being blended must agree to some extent that enough of the essential elements of their own views have been included. The process of arriving at this sort of consensus may involve extrapolation of a roughly similar sort to that considered in CEV.

Multiple attempts at axiomatization of human values have also been attempted, e.g. with a view toward providing near-term guidance to military robots (see e.g. Arkin's excellent though chillingly-titled book *Governing Lethal Behavior in Autonomous Robots* [Ark09b], the result of US military funded research). However, there are reasonably strong arguments that human values (similarly to e.g. human language or human perceptual classification rules) are too complex and multifaceted to be captured in any compact set of formal logic rules. Wallach [WA10] has made this point eloquently, and argued the necessity of fusing top-down (e.g. formal logic based) and bottom-up (e.g. self-organizing learning based) approaches to machine ethics.

A number of more sociological considerations also arise. It is sometimes argued that the risk from highly-advanced AGI going morally awry on its own may be less than that of moderately-advanced AGI being used by human beings to advocate immoral ends. This possibility gives

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rise to questions about the ethical value of various practical modalities of AGI development, for instance:

- Should AGI be developed in a top-secret installation by a select group of individuals selected for a combination of technical and scientific brilliance and moral uprightness, or other qualities deemed relevant (a "closed approach")? Or should it be developed out in the open, in the manner of open-source software projects like Linux? (an "open approach"). The open approach allows the collective intelligence of the world to more fully participate – but also potentially allows the more unsavory elements of the human race to take some of the publicly-developed AGI concepts and tools private, and develop them into AGIs with selfish or evil purposes in mind. Is there some meaningful intermediary between these extremes?
- Should governments regulate AGI, with Friendliness in mind (as advocated carefully by e.g Bill Hibbard [Hib02])? Or will this just cause AGI development to move to the handful of countries with more liberal policies? ... or cause it to move underground, where nobody can see the dangers developing? As a rough analogue, it's worth noting that the US government's imposition of restrictions on stem cell research, under President George W. Bush, appears to have directly stimulated the provision of additional funding for stem cell research in other nations like Korea, Singapore and China.

The former issue is, obviously, highly relevant to CogPrime (which is currently being developed via the open source CogPrime project); and so the various dimensions of this issues are worth briefly sketching here.

We have a strong skepticism of self-appointed elite groups that claim (even if they genuinely believe) that they know what's best for everyone, and a healthy respect for the power of collective intelligence and the Global Brain, which the open approach is ideal for tapping. On the other hand, we also understand the risk of terrorist groups or other malevolent agents forking an open source AGI project and creating something terribly dangerous and destructive. Balancing these factors against each other rigorously, seems beyond the scope of current human science.

Nobody really understands the social dynamics by which open technological knowledge plays out in our *current* world, let alone hypothetical future scenarios. Right now there exists open knowledge about many very dangerous technologies, and there exist many terrorist groups, yet these groups fortunately make scant use of these technologies. The reasons why appear to be essentially sociological – the people involved in these terrorist groups tend not to be the ones who have mastered the skills of turning public knowledge on cutting-edge technologies into real engineered systems. But while it's easy to observe this sociological phenomenon, we certainly have no way to estimate its *quantitative extent* from first principles. We don't really have a strong understanding of how safe we are right now, given the technology knowledge available right now via the Internet, textbooks, and so forth. Even relatively straightforward issues such as nuclear proliferation remain confusing, even to the experts.

It's also quite clear that keeping powerful AGI locked up by an elite group doesn't really provide reliable protection against malevolent human agents. History is rife with such situations going awry, e.g. by the leadership of the group being subverted, or via brute force inflicted by some outside party, or via a member of the elite group defecting to some outside group in the interest of personal power or reward or due to group-internal disagreements, etc. There are many things that can go wrong in such situations, and the confidence of any particular group that they are immune to such issues, cannot be taken very seriously. Clearly, neither the open nor closed approach qualifies as a panacea.

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12.3 The Value of an Explicit Goal System

One of the subtle issues confronted in the quest to design ethical AGIs is how closely one wants to emulate human ethical judgment and behavior. Here one confronts the brute fact that, even according to their own deeply-held standards, humans are not all that ethical. One high-level conclusion we came to very early in the process of designing CogPrime is that, just as humans are not the most intelligent minds achievable, they are also not the most ethical minds achievable. Even if one takes human ethics, broadly conceived, as the standard – there are almost surely possible AGI systems that are much more ethical *according to human standards* than nearly all human beings. This is not mainly because of ethics-specific features of the human mind, but rather because of the nature of the human motivational system, which leads to many complexities that drive humans to behaviors that are unethical according to their own standards. So, one of the design decisions we made for CogPrime – with ethics as well as other reasons in mind – was *not* to closely imitate the human motivational system, but rather to craft a novel motivational system combining certain aspects of the human motivational system with other profoundly non-human aspects.

On the other hand, the design of ethical AGI systems still has a lot to gain from the study of human ethical cognition and behavior. Human ethics has many aspects, which we associate here with the different types of memory, and it's important that AGI systems can encompass all of them. Also, as we will note below, human ethics develops in childhood through a series of natural stages, parallel to and entwined with the cognitive developmental stages reviewed in Chapter 11 above. We will argue that for an AGI with a virtual or robotic body, it makes sense to think of ethical development as proceeding through similar stages. In a CogPrime context, the particulars of these stages can then be understood in terms of the particulars of CogPrime's cognitive processes – which brings AGI ethics from the domain of theoretical abstraction into the realm of practical algorithm design and education.

But even if the human stages of ethical development make sense for non-human AGIs, this doesn't mean the particulars of the human motivational system need to be replicated in these AGIs, regarding ethics or other matters. A key point here is that, in the context of human intelligence, the concept of a "goal" is a descriptive abstraction. But in the AGI context, it seems quite valuable to introduce goals as explicit design elements (which is what is done in CogPrime) – both for ethical reasons and for broader AGI design reasons.

Humans may adopt goals for a time and then drop them, may pursue multiple conflicting goals simultaneously, and may often proceed in an apparently goal-less manner. Sometimes the goal that a person appears to be pursuing, may be very different than the one they think they're pursuing. Evolutionary psychology [BDL93] argues that, directly or indirectly, all humans are ultimately pursuing the goal of maximizing the inclusive fitness of their genes – but given the complex mix of evolution and self-organization in natural history [Sal93], this is hardly a general explanation for human behavior. Ultimately, in the human context, "goal" is best thought of as a frequently useful heuristic concept.

AGI systems, however, need not emulate human cognition in every aspect, and may be architected with explicit "goal systems." This provides no guarantee that said AGI systems will actually pursue the goals that their goal systems specify – depending on the role that the goal system plays in the overall system dynamics, sometimes other dynamical phenomena might intervene and cause the system to behave in ways opposed to its explicit goals. However, we submit that this design sketch provides a better framework than would exist in an AGI system closely emulating the human brain.

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We realize this point may be somewhat contentious – a counter-argument would be that the human brain is known to support at least *moderately* ethical behavior, according to human ethical standards, whereas less brain-like AGI systems are much less well understood. However, the obvious counter-counterpoints are that:

- Humans are not all that consistently ethical, so that creating AGI systems potentially much more practically powerful than humans, but with closely humanlike ethical, motivational and goal systems, could in fact be quite dangerous
- The effect on a human-like ethical/motivational/goal system of increasing the intelligence, or changing the physical embodiment or cognitive capabilities, of the agent containing the system, is unknown and difficult to predict given all the complexities involved

The course we tentatively recommend, and are following in our own work, is to develop AGI systems with explicit, hierarchically-dominated goal systems. That is:

- create one or more "top goals" (we call them Ubergoals in CogPrime)
- have the system derive subgoals from these, using its own intelligence, potentially guided by educational interaction or explicit programming
- have a significant percentage of the system's activity governed by the explicit pursuit of these goals

Note that the "significant percentage" need not be 100%; CogPrime, for example, combines explicitly goal-directed activity with other "spontaneous" activity. Requiring that all activity be explicitly goal-directed may be too strict a requirement to place on AGI architectures.

The next step, of course, is for the top-level goals to be chosen in accordance with the principle of human-Friendliness. The next one of our eight points, about the Global Brain, addresses one way of doing this. In our near-term work with CogPrime, we are using simplistic approaches, with a view toward early-stage system testing.

12.4 Ethical Synergy

An explicit goal system provides an explicit way to ensure that ethical principles (as represented in system goals) play a significant role in guiding an AGI system's behavior. However, in an integrative design like CogPrime the goal system is only a small part of the overall story, and it's important to also understand how ethics relates to the other aspects of the cognitive architecture.

One of the more novel ideas presented in this chapter is that different types of ethical intuition may be associated with different types of memory – and to possess mature ethics, a mind must display *ethical synergy* between the ethical processes associated with its memory types. Specifically, we suggest that:

- **Episodic memory** corresponds to the process of ethically assessing a situation based on similar prior situations
- **Sensorimotor memory** corresponds to "mirror neuron" type ethics, where you feel another person's feelings via mirroring their physiological emotional responses and actions
- **Declarative memory** corresponds to rational ethical judgment

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- **Procedural memory** corresponds to "ethical habit" ... learning by imitation and reinforcement to do what is right, even when the reasons aren't well articulated or understood
- **Attentional memory** corresponds to the existence of appropriate patterns guiding one to pay adequate attention to ethical considerations at appropriate times
- **Intentional memory** corresponds to the pervasion of ethics through one's choices about subgoaling (which leads into "when do the ends justify the means" ethical-balance questions)

One of our suggestions regarding AGI ethics is that an ethically mature person or AGI must both master and balance all these kinds of ethics. We will focus especially here on declarative ethics, which corresponds to Kohlberg's theory of logical ethical judgment; and episodic ethics, which corresponds to Gilligan's theory of empathic ethical judgment. Ultimately though, all five aspects are critically important; and a CogPrime system if appropriately situated and educated should be able to master and integrate all of them.

12.4.1 Stages of Development of Declarative Ethics

Complementing generic theories of cognitive development such as Piaget's and Perry's, theorists have also proposed specific stages of moral and ethical development. The two most relevant theories in this domain are those of Kohlberg and Gilligan, which we will review here, both individually and in terms of their integration and application in the AGI context.

Lawrence Kohlberg's [KLH83, Koh81] moral development model, called the "ethics of justice" by Gilligan, is based on a rational modality as the central vehicle for moral development. In our perspective this is a firmly *declarative* form of ethics, based on explicit analysis and reasoning. It is based on an impartial regard for persons, proposing that ethical consideration must be given to all individual intelligences without a priori judgment (prejudice). Consideration is given for individual merit and preferences, and the goals of an ethical decision are equal treatment (in the general, not necessarily the particular) and reciprocity. Echoing Kant's [Kan64] categorical imperative, the decisions considered most successful in this model are those which exhibit "reversibility", where a moral act within a particular situation is evaluated in terms of whether or not the act would be satisfactory even if particular persons were to switch roles within the situation. In other words, a situational, contextualized "do unto others as you would have them do unto you" criterion. The ethics of justice can be viewed as three stages (each of which has six substages, on which we will not elaborate here), depicted in Table 12.1.

In Kohlberg's perspective, cognitive development level contributes to moral development, as moral understanding emerges from increased cognitive capability in the area of ethical decision making in a social context. Relatedly, Kohlberg also looks at stages of social perspective and their consequent interpersonal outlook. As shown in Table 12.1, these are correlated to the stages of moral development, but also map onto Piagetian models of cognitive development (as pointed out e.g. by Gibbs [Gib78], who presents a modification/interpretation of Kohlberg's ideas intended to align them more closely with Piaget's). Interpersonal outlook can be understood as rational understanding of the psychology of other persons (a theory of mind, with or without empathy). Stage One, emergent from the infantile congitive stage, is entirely selfish as only self awareness has developed. As cognitive sophistication about ethical considerations increases, so do the moral and social perspective stages. Concrete and formal cognition bring about the first instrumental egoism, and then social relations and systems perspectives, and

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Stage	Substages
Pre-Conventional	• Obedience and Punishment Orientation • Self-interest orientation
Conventional	• Interpersonal accord (conformity) orientation • Authority and social-order maintaining (law and order) orientation
Post-Conventional	• Social contract (human rights) orientation • Universal ethical principles (universal human rights) orientation

Table 12.1: Kohlberg's Stages of Development of the Ethics of Justice

from formal and then reflexive thinking about ethics comes the post-conventional modalities of contractualism and universal mutual respect.

Stage of Social Perspective	Interpersonal Outlook
Blind egoism	No interpersonal perspective. Only self is considered.
Instrumental egoism	See that others have goals and perspectives, and either conform to or rebel against norms.
Social Relationships perspective	Able to see abstract normative systems
Social Systems perspective	Recognize positive and negative intentions
Contractual perspective	Recognize that contracts (mutually beneficial agreements of any kind) will allow intelligences to increase the welfare of both.
Universal principle of mutual respect	See how human fallibility and frailty are impacted by communication.

Table 12.2: Kohlberg's Stages of Development of Social Perspective and Interpersonal Morals

12.4.1.1 Uncertain Inference and the Ethics of Justice

Taking our cue from the analysis given in Chapter 11 of Piagetan stages in uncertain inference based AGI systems (such as CogPrime), we may explore the manifestation of Kohlberg's stages in AGI systems of this nature. Uncertain inference seems generally well-suited as a declarative-ethics learning system, due to the nuanced ethical environment of real world situations. Probabilistic knowledge networks can model belief networks, imitative reinforcement learning based ethical pedagogy, and even simplistic moral maxims. In principle, they have the flexibility to deal with complex ethical decisions, including not only weighted "for the greater

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good" dichotomous decision making, but also the ability to develop moral decision networks which do not require that all situations be solved through resolution of a dichotomy.

When more than one person is being affected by an ethical decision, making a decision based on reducing two choices to a single decision can often lead to decisions of dubious ethics. However, a sufficiently complex uncertain inference network can represent alternate choices in which multiple actions are taken that have equal (or near equal) belief weight but have very different particulars – but because the decisions are applied in different contexts (to different groups of individuals) they are morally equivalent. Though each individual action appears equally believable, were any single decision applied to the entire population one or more individual may be harmed, and the morally superior choice is to make case-dependent decisions. Equal moral treatment is a general principle, and too often the mistake is made by thinking that to achieve this general principle the particulars must be equal. This is not the case. Different treatment of different individuals can result in morally equivalent treatment of all involved individuals, and may be vastly morally superior to treating all the individuals with equal particulars. Simply taking the largest population and deciding one course of action based on the result that is most appealing to that largest group is not generally the most moral action.

Uncertain inference, especially a complex network with high levels of resource access as may be found in a sophisticated AGI, is well suited for complex decision making resulting in a multitude of actions, and of analyzing the options to find the set of actions that are ethically optimal particulars for each decision context. Reflexive cognition and post-commitment moral understanding may be the goal stages of an AGI system, or any intelligence, but the other stages will be passed through on the way to that goal, and realistically some minds will never reach higher order cognition or morality with regards to any context, and others will not be able to function at this high order in every context (all currently known minds fail to function at the highest order cognitively or morally in some contexts).

Infantile and concrete cognition are the underpinnings of the egoist and socialized stages, with formal aspects also playing a role in a more complete understanding of social models when thinking using the social modalities. Cognitively infantile patterns can produce no more than blind egoism as without a theory of mind, there is no capability to consider the other. Since most intelligences acquire concrete modality and therefore some nascent social perspective relatively quickly, most egoists are instrumental egoists. The social relationship and systems perspectives include formal aspects which are achieved by systematic social experimentation, and therefore experiential reinforcement learning of correct and incorrect social modalities. Initially this is a one-on-one approach (relationship stage), but as more knowledge of social action and consequences is acquired, a formal thinker can understand not just consequentiality but also intentionality in social action.

Extrapolation from models of individual interaction to general social theoretic notions is also a formal action. Rational, logical positivist approaches to social and political ideas, however, are the norm of formal thinking. Contractual and committed moral ethics emerges from a higher-order formalization of the social relationships and systems patterns of thinking. Generalizations of social observation become, through formal analysis, systems of social and political doctrine. Highly committed, but grounded and logically supportable, belief is the hallmark of formal cognition as expressed contractual moral stage. Though formalism is at work in the socialized moral stages, its fullest expression is in committed contractualism.

Finally, reflexive cognition is especially important in truly reaching the post-commitment moral stage in which nuance and complexity are accommodated. Because reflexive cognition is necessary to change one's mind not just about particular rational ideas, but whole *ways of*

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thinking, this is a cognitive precedent to being able to reconsider an entire belief system, one that has had contractual logic built atop reflexive adherence that began in early development. If the initial moral system is viewed as positive and stable, then this cognitive capacity is seen as dangerous and scary, but if early morality is stunted or warped, then this ability is seen as enlightened. However, achieving this cognitive stage does not mean one automatically changes their belief systems, but rather that the mental machinery is in place to consider the possibilities. Because many people do not reach this level of cognitive development in the area of moral and ethical thinking, it is associated with negative traits ("moral relativism" and "flip-flopping"). However, this cognitive flexibility generally leads to more sophisticated and applicable moral codes, which in turn leads to morality which is actually more stable because it is built upon extensive and deep consideration rather than simple adherence to reflexive or rationalized ideologies.

12.4.2 Stages of Development of Empathic Ethics

Complementing Kohlberg's logic-and-justice-focused approach, Carol Gilligan's [Gil82] "ethics of care" model is a moral development theory which posits that empathetic understanding plays the central role in moral progression from an initial self-centered modality to a socially responsible one. The ethics of care model is concerned with the ways in which an individual cares (responds to dilemmas using empathetic responses) about self and others. As shown in Table 12.3, the ethics of care is broken into the same three primary stage as Kohlberg, but with a focus on empathetic, emotional caring rather than rationalized, logical principles of justice.

Stage	**Principle of Care**
Pre-Conventional	Individual Survival
Conventional	Self Sacrifice for the Greater Good
Post-Conventional	Principle of Nonviolence (do not hurt others, or oneself)

Table 12.3: Gilligan's Stages of the Ethics of Care

For an "ethics of care" approach to be applied in an AGI, the AGI must be capable of internal simulation of other minds it encounters, in a similar manner to how humans regularly simulate one another internally. Without any mechanism for internal simulation, it is unlikely that an AGI can develop any sort of empathy toward other minds, as opposed to merely logically or probabilistically modeling other agents' behavior or other minds' internal contents. In a CogPrime context, this ties in closely with how CogPrime handles episodic knowledge – partly via use of an internal simulation world, which is able to play "mental movies" of prior and hypothesized scenarios within the AGI system's mind.

However, in humans empathy involves more than just simulation, it also involves sensorimotor responses, and of course emotional responses – a topic we will discuss in more depth in Appendix ?? where we review the functionality of mirror neurons and mirror systems in the human brains. When we see or hear someone suffering, this sensory input causes motor responses in us similar to if we were suffering ourselves, which initiates emotional empathy and corresponding cognitive processes.

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Thus, empathic "ethics of care" involves a combination of episodic and sensorimotor ethics, complementing the mainly declarative ethics associated with the "ethics of justice."

In Gilligan's perspective, the earliest stage of ethical development occurs before empathy becomes a consistent and powerful force. Next, the hallmark of the conventional stage is that at this point, the individual is so overwhelmed with their empathic response to others that they neglect themselves in order to avoid hurting others. Note that this stage doesn't occur in Kohlberg's hierarchy at all. Kohlberg and Gilligan both begin with selfish unethicality, but their following stages diverge. A person could in principle manifest Gilligan's conventional stage without having a refined sense of justice (thus not entering Kohlberg's conventional stage); or they could manifest Kohlberg's conventional stage without partaking in an excessive degree of self-sacrifice (thus not entering Gilligan's conventional stage). We will suggest below that in fact the empathic and logical aspects of ethics are more unified in real human development than these separate theories would suggest. However, even if this is so, the possibility is still there that in some AGI systems the levels of declarative and empathic ethics could wildly diverge.

It is interesting to note that Gilligan's and Kohlberg's final stages converge more closely than their intermediate ones. Kohlberg's post-conventional stage focuses on universal rights, and Gilligan's on universal compassion. Still, the foci here are quite different; and, as will be elaborated below, we believe that both Kohlberg's and Gilligan's theories constitute very partial views of the actual end-state of ethical advancement.

12.4.3 An Integrative Approach to Ethical Development

We feel that both Kohlberg's and Gilligan's theories contain elements of the whole picture of ethical development, and that both approaches are necessary to create a moral, ethical artificial general intelligence – just as, we suggest, both internal simulation and uncertain inference are necessary to create a sufficiently intelligent and volitional intelligence in the first place. Also, we contend, the lack of direct analysis of the underlying psychology of the stages is a deficiency shared by both the Kohlberg and Gilligan models as they are generally discussed. A successful model of integrative ethics necessarily contains elements of both the care and justice models, as well as reference to the underlying developmental psychology and its influence on the character of the ethical stage. Furthermore, intentional and attentional ethics need to be brought into the picture, complementing Kohlberg's focus on declarative knowledge and Gilligan's focus on episodic and sensorimotor knowledge.

With these notions in mind, we propose the following integrative theory of the stages of ethical development, shown in Tables 12.4, 12.5 and 12.6. In our integrative model, the justice-based and empathic aspects of ethical judgment are proposed to develop together. Of course, in any one individual, one or another aspect may be dominant. Even so, however, the combination of the two is equally important as either of the two individual ingredients.

For instance, we suggest that in any psychologically healthy human, the conventional stage of ethics (typifying childhood, and in many cases adulthood as well) involves a combination of Gilligan-esqe empathic ethics and Kohlberg-esque ethical reasoning. This combination is supported by Piagetan concrete operational cognition, which allows moderately sophisticated linguistic interaction, theory of mind, and symbolic modeling of the world.

And, similarly, we propose that in any truly ethically mature human, empathy and rational justice are both fully developed. Indeed the two interpenetrate each other deeply.

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Once one goes beyond simplistic, childlike notions of fairness ("an eye for an eye" and so forth), applying rational justice in a purely intellectual sense is just as difficult as any other real-world logical inference problem. Ethical quandaries and quagmires are easily encountered, and are frequently cut through by a judicious application of empathic simulation.

On the other hand, empathy is a far more powerful force when used in conjunction with reason: analogical reasoning lets us empathize with situations we have never experienced. For instance, a person who has never been clinically depressed may have a hard time empathizing with individuals who are; but using the power of reason, they can imagine their worst state of depression magnified by several times and then extended over a long period of time, and then reason about what this might be like ... and empathize based on their inferential conclusion. Reason is not antithetical to empathy but rather is the key to making empathy more broadly impactful.

Finally, the enlightened stage of ethical development involves both a deeper compassion and a more deeply penetrating rationality and objectiveness. Empathy with all sentient beings is manageable in everyday life only once one has deeply reflected on one's own self and largely freed oneself of the confusions and illusions that characterize much of the ordinary human's inner existence. It is noteworthy, for example, that Buddhism contains both a richly developed ethics of universal compassion, and also an intricate logical theory of the inner workings of cognition [Stc00], detailing in exquisite rational detail the manner in which minds originate structures and dynamics allowing them to comprehend themselves and the world.

12.4.4 Integrative Ethics and Integrative AGI

What does our integrative approach to ethical development have to say about the ethical development of AGI systems? The lessons are relatively straighforward, if one considers an AGI system that, like CogPrime, explicitly contains components dedicated to logical inference and to simulation. Application of the above ethical ideas to other sorts of AGI systems is also quite possible, but would require a lengthier treatment and so won't be addressed here.

In the context of a CogPrime-type AGI system, Kolhberg's stages correspond to increasingly sophisticated application of logical inference to matters of rights and fairness. It is not clear whether humans contain an innate sense of fairness. In the context of AGIs, it would be possible to explicitly wire a sense of fairness into an AGI system, but in the context of a rich environment and active human teachers, this actually appears quite unnecessary. Experiential instruction in the notions of rights and fairness should suffice to teach an inference-based AGI system how to manipulate these concepts, analogously to teaching the same AGI system how to manipulate number, mass and other such quantities. Ascending the Kohlberg stages is then mainly a matter of acquiring the ability to carry out suitably complex inferences in the domain of rights and fairness. The hard part here is inference control – choosing which inference steps to take – and in a sophisticated AGI inference engine, inference control will be guided by experience, so that the more ethical judgments the system has executed and witnessed, the better it will become at making new ones. And, as argued above, simulative activity can be extremely valuable for aiding with inference control. When a logical inference process reaches a point of acute uncertainty (the backward or forward chaining inference tree can't decide which expansion step to take), it can run a simulation to cut through the confusion – i.e., it can use empathy to decide which

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Stage	Characteristics
Pre-ethical	• Piagetan infantile to early concrete (aka pre-operational) • Radical selfishness or selflessness may, but do not necessarily, occur • No coherent, consistent pattern of consideration for the rights, intentions or feelings of others • Empathy is generally present, but erratically
Conventional Ethics	• Concrete cognitive basis • Perry's Dualist and Multiple stages • The common sense of the Golden Rule is appreciated, with cultural conventions for abstracting principles from behaviors • One's own ethical behavior is explicitly compared to that of others • Development of a functional, though limited, theory of mind • Ability to intuitively conceive of notions of fairness and rights • Appreciation of the concept of law and order, which may sometimes manifest itself as systematic obedience or systematic disobedience • Empathy is more consistently present, especially with others who are directly similar to oneself or in situations similar to those one has directly experienced • Degrees of selflessness or selfishness develop based on ethical groundings and social interactions.

Table 12.4: Integrative Model of the Stages of Ethical Development, Part 1

logical inference step to take in thinking about applying the notions of rights and fairness to a given situation.

Gilligan's stages correspond to increasingly sophisticated control of empathic simulation – which in a CogPrime-type AGI system, is carried out by a specific system component devoted to running internal simulations of aspects of the outside world, which includes a subcomponent specifically tuned for simulating sentient actors. The conventional stage has to do with the raw, uncontrolled capability for such simulation; and the post-conventional stage corresponds to its contextual, goal-oriented control. But controlling empathy, clearly, requires subtle management of various uncertain contextual factors, which is exactly what uncertain logical inference is good at – so, in an AGI system combining an uncertain inference component with a simulative component, it is the inference component that would enable the nuanced control of empathy allowing the ascent to Gilligan's post-conventional stage.

In our integrative perspective, in the context of an AGI system integrating inference and simulation components, we suggest that the ascent from the pre-ethical to the conventional stage may be carried out largely via independent activity of these two components. Empathy is needed, and reasoning about fairness and rights are needed, but the two need not intimately and sensitively intersect – though they must of course intersect to some extent.

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Stage	Characteristics
Mature Ethics	• Formal cognitive basis • Perry's Relativist and "Constructed Knowledge" stages • The abstraction involved with applying the Golden Rule in practice is more fully understood and manipulated, leading to limited but nonzero deployment of the Categorical Imperative • Attention is paid to shaping one's ethical principles into a coherent logical system • Rationalized, moderated selfishness or selflessness. • Empathy is extended, using reason, to individuals and situations not directly matching one's own experience • Theory of mind is extended, using reason, to counterintuitive or experientially unfamiliar situations • Reason is used to control the impact of empathy on behavior (i.e. rational judgments are made regarding when to listen to empathy and when not to) • Rational experimentation and correction of theoretical models of ethical behavior, and reconciliation with observed behavior during interaction with others. • Conflict between pragmatism of social contract orientation and idealism of universal ethical principles. • Understanding of ethical quandaries and nuances develop (pragmatist modality), or are rejected (idealist modality). • Pragmatically critical social citizen. Attempts to maintain a balanced social outlook. Considers the common good, including oneself as part of the commons, and acts in what seems to be the most beneficial and practical manner.

Table 12.5: Integrative Model of the Stages of Ethical Development, Part 2

The main engine of advancement from the conventional to mature stage, we suggest, is robust and subtle integration of the simulative and inferential components. To expand empathy beyond the most obvious cases, analogical inference is needed; and to carry out complex inferences about justice, empathy-guided inference-control is needed.

Finally, to advance from the mature to the enlightened stage, what is required is a very advanced capability for unified reflexive inference and simulation. The system must be able to understand itself deeply, via modeling itself both simulatively and inferentially – which will generally be achieved via a combination of being good at modeling, and becoming less convoluted and more coherent, hence making self-modeling easier.

Of course, none of this tells you in detail how to create an AGI system with advanced ethical capabilities. What it does tell you, however, is one possible path that may be followed to achieve this end goal. If one creates an integrative AGI system with appropriately interconnected inferential and simulative components, and treats it compassionately and fairly, and provides it extensive, experientially grounded ethical instruction in a rich social environment, then the AGI system should be able to ascend the ethical hierarchy and achieve a high level of ethical sophistication. In fact it should be able to do so more reliably than human beings because of the capability we have to identify its errors via inspecting its internal knowedge-stage, which

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Stage	Characteristics
Enlightened Ethics	• Reflexive cognitive basis • Permeation of the categorical imperative and the quest for coherence through inner as well as outer life • Experientially grounded and logically supported rejection of the illusion of moral certainty in favor of a case-specific analytical and empathetic approach that embraces the uncertainty of real social life • Deep understanding of the illusory and biased nature of the individual self, leading to humility regarding one's own ethical intuitions and prescriptions • Openness to modifying one's deepest, ethical (and other) beliefs based on experience, reason and/or empathic communion with others • Adaptive, insightful approach to civil disobedience, considering laws and social customs in a broader ethical and pragmatic context • Broad compassion for and empathy with all sentient beings • A recognition of inability to operate at this level at all times in all things, and a vigilance about self-monitoring for regressive behavior.

Table 12.6: Integrative Model of the Stages of Ethical Development, Part 3

will enable us to tailor its environment and instructions more suitably than can be done in the human case.

If an absolute guarantee of the ethical soundness of an AGI is what one is after, the line of thinking proposed here is not at all useful. Experiential education is by its nature an uncertain thing. One can strive to minimize the uncertainty, but it will still exist. Inspection of the internals of an AGI's mind is not a total solution to uncertainty minimization, because any AGI capable of powerful general intelligence is going to have a complex internal state that no external observer will be able to fully grasp, no matter how transparent the knowledge representation.

However, if what one is after is a plausible, pragmatic path to architecting and educating ethical AGI systems, we believe the ideas presented here constitute a sensible starting-point. Certainly there is a great deal more to be learned and understood – the science and practice of AGI ethics, like AGI itself, are at a formative stage at present. What is key, in our view, is that as AGI technology develops, AGI ethics develops alongside and within it, in a thoroughly coupled way.

12.5 Clarifying the Ethics of Justice: Extending the Golden Rule in to a Multifactorial Ethical Model

One of the issues with the "ethics of justice" as reviewed above, which makes it inadequate to serve as the sole basis of an AGI ethical system (though it may certainly play a significant

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role), is the lack of any clear formulation of what "justice" means. This section explores this issue, via detailed consideration of the "Golden Rule" folk maxim **do unto others as you would have them do unto you** – a classical formulation of the notion of fairness and justics – to AGI ethics. Taking the Golden Rule as a starting-point, we will elaborate five ethical imperatives that incorporate aspects of the notion of ethical synergy discussed above. Simple as it may seem, the Golden Rule actually elicits a variety of deep issues regarding the relationship between ethics, experience and learning. When seriously analyzed, it results in a multifactorial elaboration, involving the combination of various factors related to the basic Golden Rule idea. Which brings us back in the end to the potential value of methods like CEV, CAV or CBV for understanding how human ethics balances the multiple factors. Our goal here is not to present any kind of definitive analysis of the ethics of justice, but just to briefly and roughly indicate a number of the relevant significant issues – things that anyone designing or teaching an AGI would do well to keep in mind.

The trickiest aspect of the Golden Rule, as has been frequently observed, is achieving the right level of abstraction. Taken too literally, the Golden Rule would suggest, for instance, that a parent should not wipe a child's soiled bottom because the parent does not want the child to wipe the parent's soiled bottom. But if the parent interprets the Golden Rule more intelligently and abstractly, the parent may conclude that they should wipe the child's bottom after all: they should "wipe the child's bottom when the child can't do it themselves", consistently with believing that the child should "wipe the parent's bottom when the parent can't do it themselves" (which may well happen eventually should the parent develop incontinence in old age).

This line of thinking leads to Kant's Categorical Imperative [Kan64] which (in one interpretation) states essentially that one should "Act only according to that maxim whereby you can at the same time will that it should become a universal law." The Categorical Imperative adds precision to the Golden Rule, but also removes the practicality of the latter. Formalizing the "implicit universal law" underlying an everyday action is a huge problem, falling prey to the same issue that has kept us from adequately formalizing the rules of natural language grammar, or formalizing common-sense knowledge about everyday object like cups, bowls and grass (substantial effort notwithstanding, e.g. Cyc in the commonsense knowledge case, and the whole discipline of modern linguistics in the NL case). There is no way to apply the Categorical Imperative, as literally stated, in everyday life.

Furthermore, if one wishes to teach ethics as well as to practice it, the Categorical Imperative actually has a significant disadvantage compared to some other possible formulations of the Golden Rule. The problem is that, if one follows the Categorical Imperative, one's fellow members of society may well never understand the principles under which one is acting. Each of us may internally formulate abstract principles in a different way, and these may be very difficult to communicate, especially among individuals with different belief systems, different cognitive architectures, or different levels of intelligence. Thus, if one's goal is not just to act ethically, but to encourage others to act ethically by setting a good example, the Categorical Imperative may not be useful at all, as others may be unable to solve the "inverse problem" of guessing your intended maxim from your observed behavior.

On the other hand, one wouldn't want to universally restrict one's behavioral maxims to those that one's fellow members of society can understand – in that case, one would have to act with a two-year old or a dog according to principles that they could understand, which would clearly be unethical according to human common sense. (Every two-year-old, once they grow up, would be grateful to their parents for not following this sort of principle.)

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And the concept of "setting a good example" ties in with an important concept from learning theory: imitative learning. Humans appear to be hard-wired for imitative learning, in part via mirror neuron systems in the brain; and, it seems clear that at least in the early stages of AGI development, imitative learning is going to play a key role. Copying what other agents do is an extremely powerful heuristic, and while AGIs may eventually grow beyond this, much of their early ethical education is likely to arise during a phase when they have not done so. A strength of the classic Golden Rule is that one is acting according to behaviors that one wants one's observers to imitate – which makes sense in that many of these observers will be using imitative learning as a significant part of their learning toolkit.

The truth of the matter, it seems, is (as often happens) not all that simple or elegant. Ethical behavior seems to be most pragmatically viewed as a multi-objective optimization problem, where among the multiple objectives are three that we have just discussed, and two others that emerge from learning theory and will be discussed shortly:

1. The **imitability** (i.e. the Golden Rule fairly narrowly and directly construed): the goal of acting in a way so that having others directly imitate one's actions, in directly comparable contexts, is desirable to oneself
2. The **comprehensibility**: the goal of acting in a way so that others can understand the principles underlying one's actions
3. **Experiential groundedness**. An intelligent agent should not be expected to act according to an ethical principle unless there are many examples of the principle-in-action in its own direct or observational experience
4. The **categorical imperative**: Act according to abstract principles that you would be happy to see implemented as universal laws
5. **Logical coherence.** An ethical system should be roughly logically coherent, in the sense that the different principles within it should mesh well with one another and perhaps even naturally emerge from each other.

Just for convenience, without implying any finality or great profundity to the list, we will refer to these as the "five imperatives."

The above are all ethical objectives to be valued and balanced, to different extents in different contexts. The imitability imperative, obviously, loses importance in societies of agents that don't make heavy use of imitative learning. The comprehensibility imperative is more important in agents that value social community-building generally, and less so in agent that are more isolative and self-focused.

Note that the fifth point given above is logically of a different nature than the four previous ones. The first four imperatives govern individual ethical principles; the fifth regards systems of ethical principles, as they interact with each other. Logical coherence is of significant but varying importance in human ethical systems. Huge effort has been spent by theologians of various stripes in establishing and refining the logical coherence of the ethical systems associated with their religions. However, it is arguably going to be even more important in the context of AGI systems, especially if these AGI systems utilize cognitive methods based on logical inference, probability theory or related methods.

Experiential groundedness is important because making pragmatic ethical judgments is bound to require reference to an internal library of examples ("episodic ethics") in which ethical principles have previously been applied. This is required for analogical reasoning, and in logic-based AGI systems, is also required for pruning of the logical inference trees involved in determining ethical judgments.

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To the extent that the Golden Rule is valued as an ethical imperative, experiential grounding may be supplied via observing the behaviors of others. This in itself is a powerful argument in favor of the Golden Rule: without it, the experiential library a system possesses is restricted to its own experience, which is bound to be a very small library compared to what it can assemble from observing the behaviors of others.

The overall upshot is that, ideally, an ethical intelligence should **act according to a logically coherent system of principles, which are exemplified in its own direct and observational experience, which are comprehensible to others and set a good example for others, and which would serve as adequate universal laws if somehow thus implemented**. But, since this set of criteria is essentially impossible to fulfill in practice, real-world intelligent agents must balance these various criteria – often in complex and contextually-dependent ways.

We suggest that ethically advanced humans, in their pragmatic ethical choices, tend to act in such a way as to appropriately contextually balance the above factors (along with other criteria, but we have tried to articulate the most key factors). This sort of multi-factorial approach is not as crisp or elegant as unidimensional imperatives like the Golden Rule or the Categorical Imperative, but is more realistic in light of the complexly interacting multiple determinants guiding individual and group human behavior.

And this brings us back to CEV, CAV, CBV and other possible ways of mining ethical supergoals from the community of existing human minds. Given that abstract theories of ethics, when seriously pursued as we have done in this section, tend to devolve into complex balancing acts involving multiple factors – one then falls back into asking how human ethical systems habitually perform these balancing acts. Which is what CEV, CAV, CBV try to measure.

12.5.1 The Golden Rule and the Stages of Ethical Development

Next we explore more explicitly how these Golden Rule based imperatives align with the ethical developmental stages we have outlined here. With this in mind, specific ethical qualities corresponding to the five imperatives have been italicized in the above table of developmental stages.

It seems that imperatives 1-3 are critical for the passage from the pre-ethical to the conventional stages of ethics. A child learns ethics largely by copying others, and by being interacted with according to simply comprehensible implementations of the Golden Rule. In general, when interacting with children learning ethics, it is important to act according to principles they can comprehend. And given the nature of the concrete stage of cognitive development, experiential groundedness is a must.

As a hypothesis regarding the dynamics underlying the psychological development of conventional ethics, what we propose is as follows: The emergence of concrete-stage cognitive capabilities leads to the capability for fulfillment of ethical imperatives 1 and 2 – a comprehensible and workable implementation of the Golden Rule, based on a combination of inferential and simulative cognition (operating largely separately at this stage, as will be conjectured below). The effective interoperation of ethical imperatives 1-3, enacted in an appropriate social environment, then leads to the other characteristics of the conventional ethical stage. The first three imperatives can thus be viewed as the seed from which springs the general nature of conventional ethics.

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On the other hand, logical coherence and the categorical imperative (imperatives 5 and 4) are matters for the formal stage of cognitive development, which come along only with the mature approach to ethics. These come from abstracting ethics beyond direct experience and manipulating them abstractly and formally – a stage which has the potential for more deeply and broadly ethical behavior, but also for more complicated ethical perversions (it is the mature capability for formal ethical reasoning that is able to produce ungrounded abstractions such as "I'm torturing you for your own good"). Developmentally, we suggest that once the capability for formal reasoning matures, the categorical imperative and the quest for logical ethical coherence naturally emerge, and the sophisticated combination of inferential and simulative cognition embodied in an appropriate social context then result in the emergence of the various characteristics typifying the mature ethical stage.

Finally, it seems that one key aspect of the passage from the mature to the enlightened stage of ethics is the penetration of these two final imperatives more and more deeply into the judging mind itself. The reflexive stage of cognitive development is in part about seeking a deep logical coherence between the aspects of one's own mind, and making reasoned modifications to one's mind so as to improve the level of coherence. And, much of the process of mental discipline and purification that comes with the passage to enlightened ethics has to do with the application of the categorical imperative to one's own thoughts and feelings – i.e. making a true inner systematic effort to think and feel only those things one judges are actually generally good and right to be thinking and feeling. Applying these principles internally appears critical for effectively applying them externally, for reasons that are doubtlessly bound up with the interpenetration of internal and external reality within the thinking mind, and for the "distributed cognition" phenomenon wherein individual mind is itself an approximative abstraction to the reality in which each individual's mind is pragmatically extended across their social group and their environment [Hut95].

Obviously, these are complex issues and we're not posing the exploratory discussion given here as conclusive in any sense. But what seems generally clear from this line of thinking is that the complex balance between the multiple factors involved in AGI ethics, shifts during a system's development. If you did CEV, CAV or CBV among five year old humans, ten year old humans, or adult humans, you would get different results. Probably you'd also get different results from senior citizens! The way the factors are balanced depends on the mind's cognitive and emotional stage of development.

12.5.2 The Need for Context-Sensitivity and Adaptiveness in Deploying Ethical Principles

As well as depending on developmental stage, there is also an obvious and dramatic context-sensitivity involved here – both in calculating the fulfillment of abstract ethical imperatives, and in balancing various imperatives against each other. As an example, consider the simple Asimovian maxim "I will not harm humans," which may be seen to follow from the Golden Rule for any agent that doesn't itself want to be harmed, and that considers humans as valid agents on the same ethical level as itself. A more serious attempt to formulate this as an ethical maxim might look something like

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"I will not harm humans, nor through inaction allow harm to befall them. In situations wherein one or more humans is attempting to harm another individual or group, I shall endeavor to prevent this harm through means which avoid further harm. If this is unavoidable, I shall select the human party to back based on a reckoning of their intentions towards others, and implement their defense through the optimal balance between harm minimization and efficacy. My ultimate goal is to preserve as much as possible of humanity, even if an individual or subgroup of humans must come to harm to do so."

However, it's obvious that even a more elaborated principle like this is potentially subject to extensive abuse. Many of the genocides scarring human history have been committed with the goal of preserving and bettering humanity writ large, at the expense of a group of "undesirables." Further refinement would be necessary in order to define when the greater good of humanity may actually be served through harm to others. A first actor principle of aggression might seem to solve this problem, but sometimes first actors in violent conflict are taking preemptive measures against the stated goals of an enemy to destroy them. Such situations become very subtle. A single simple maxim can not deal with them very effectively. Networks of interrelated decision criteria, weighted by desirability of consequence and with reference to probabilistically ordered potential side-effects (and their desirability weightings), are required in order to make ethical judgments. The development of these networks, just like any other knowledge network, comes from both pedagogy and experience – and different thoughtful, ethical agents are bound to arrive at different knowledge-networks that will lead to different judgments in real-world situations.

Extending the above "mostly harmless" principle to AGI systems, not just humans, would cause it to be more effective in the context of imitative learning. The principle then becomes an elaborated version of "I will not harm sentient beings." As the imitative-learning-enabled AGI observes humans acting so as to minimize harm to it, it will intuitively and experientially learn to act in such a way as to minimize harm to humans. But then this extension naturally leads to confusion regarding various borderline cases. What is a sentient being exactly? Is a sleeping human sentient? How about a dead human whose information could in principle be restored via obscure quantum operations, leading to some sort of resurrection? How about an AGI whose code has been improved – is there an obligation to maintain the prior version as well, if it is substantially different that its upgrade constitutes a whole new being?

And what about situations in which failure to preserve oneself will cause much more harm to others than acting in self defense will. It may be the case that human or group of humans seeks to destroy an AGI in order to pave the way for the enslavement or murder of people under the protection of the AGI. Even if the AGI has been given an ethical formulation of the "mostly harmless" principle which allows it to harm the attacking humans in order to defend its charges, if it is not able to do so in order to defend itself, simply destroying the AGI first will enable the slaughter of those who rely on it. Perhaps a more sensible formulation would allow for some degree of self defense, and Asimov solved this problem with his third law. But where to draw the line between self defense and the greater good also becomes a very complicated issue.

Creating hard and fast rules to cover all the various situations that may arise is essentially impossible – the world is ever-changing and ethical judgments must adapt accordingly. This has been true even throughout human history – so how much truer will it be as technological acceleration continues? What is needed is a system that can deploy its ethical principles in an adaptive, context-appropriate way, as it grows and changes along with the world it's embedded in.

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And this context-sensitivity has the result of intertwining ethical judgment with all sorts of other judgments – making it effectively impossible to extract "ethics" as one aspect of an intelligent system, separate from other kinds of thinking and acting the system does. This resonates with many prior observations by others, e.g. Eliezer Yudkowsky's insistence that what we need are not ethicists of science and engineering, but rather ethical scientists and engineers – because the most meaningful and important ethical judgments regarding science and engineering generally come about in a manner that's thoroughly interwined with technical practice, and hence are very difficult for a non-practitioner to richly appreciate [Gil82].

What this context-sensitivity means is that, unless humans and AGIs are experiencing the same sorts of contexts, and perceiving these contexts in at least approximately parallel ways, there is little hope of translating the complex of human ethical judgments to these AGIs. This conclusion has significant implications for which routes to AGI are most likely to lead to success in terms of AGI ethics. We want early-stage AGIs to grow up in a situation where their minds are primarily and ongoingly shaped by shared experiences with humans. Supplying AGIs with abstract ethical principles is not likely to do the trick, because the essence of human ethics in real life seems to have a lot to do with its intuitively appropriate application in various contexts. We transmit this sort of ethical praxis to humans via shared experience, and it seems most probably that in the case of AGIs the transmission must be done the same sort of way.

Some may feel that simplistic maxims are less "error prone" than more nuanced, context-sensitive ones. But the history of teaching ethics to human students does not support the idea that limiting ethical pedagogy to slogans provides much value in terms of ethical development. If one proceeds from the idea that AGI ethics must be hard-coded in order to work, then perhaps the idea that simpler ethics means simpler algorithms, and therefore less error potential, has some merit as an initial state. However, any learning system quickly diverges from its initial state, and an ongoing, nuanced relationship between AGIs and humans will – whether we like it or not – form the basis for developmental AGI ethics. AGI intransigence and enmity is not inevitable, but what is inevitable is that a learning system will acquire ideas about both theory and actions from the other intelligent entities in its environment. Either we teach AGIs positive ethics through our interactions with them – both presenting ethical theory and behaving ethically to them – or the potential is there for them to learn antisocial behavior from us even if we pre-load them with some set of allegedly inviolable edicts.

All in all, developmental ethics is not as simple as many people hope. Simplistic approaches often lead to disastrous consequences among humans, and there is no reason to think this would be any different in the case of artificial intelligences. Most problems in ethics have cases in which a simplistic ethical formulation requires substantial revision to deal with extenuating circumstances and nuances found in real world situations. Our goal in this chapter is not to enumerate a full set of complex networks of interacting ethical formulations as applicable to AGI systems (that is a project that will take years of both theoretical study and hands-on research), but rather to point out that this program must be undertaken in order to facilitate a grounded and logically defensible system of ethics for artificial intelligences, one which is as unlikely to be undermined by subsequent self-modification of the AGI as is possible. Even so, there is still the risk that whatever predispositions are imparted to the AGIs through initial codification of ethical ideas in the system's internal logic representation, and through initial pedagogical interactions with its learning systems, will be undermined through reinforcement learning of antisocial behavior if humans do not interact ethically with AGIs. Ethical treatment is a necessary task for grounding ethics and making them unlikely to be distorted during internal rewriting.

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The implications of these ideas for ethical instruction are complex and won't be fully elaborated here, but a few of them are compact and obvious:

1. The teacher(s) must be observed to follow their own ethical principles, in a variety of contexts that are meaningful to the AGI
2. The system of ethics must be relevant to the recipient's life context, and embedded within their understanding of the world.
3. Ethical principles must be grounded in both theory-of-mind thought experiments (emphasizing logical coherence), and in real life situations in which the ethical trainee is required to make a moral judgment and is rewarded or reproached by the teacher(s), including the imparting of explanatory augmentations to the teachings regarding the reason for the particular decision on the part of the teacher.

Finally, harking forward to the next section which emphasizes the importance of respecting the freedom of AGIs, we note that it is implicit in our approach to AGI ethics instruction that we consider the student, the AGI system, as an autonomous agent with its own "will" and its own capability to flexibly adapt to its environment and experience. We contend that the creation of ethical formations obeying the above imperatives is not antithetical to the possession of a high degree of autonomy on the part of AGI systems. On the contrary, to have any chance of succeeding, it requires fairly cognitively autonomous AGI systems. When we discuss the idea of ethical formulations that are unlikely to be undermined by the ongoing self-revision of an AGI mind, we are talking about those which are sufficiently believable that a volitional intelligence with the capacity to revise its knowledge ("change its mind") will find the formulations sufficiently convincing that there will be little incentive to experiment with potentially disastrous ethical alternatives. The best hope of achieving this is via the human mentors and trainers setting a good example in a context supporting rich interaction and observation, and presenting compelling ethical arguments that are coherent with the system's experience.

12.6 The Ethical Treatment of AGIs

We now make some more general comments about the relation of the Golden Rule and its elaborations in an AGI context. While the Golden Rule is considered somewhat commonsensical as a maxim for guiding human-human relationships, it is surprisingly controversial in terms of historical theories of AGI ethics. At its essence, any "Golden Rule" approach to AGI ethics involves humans treating AGIs ethically by – in some sense; at some level of abstraction – treating them as we wish to ourselves be treated. It's worth pointing out the wild disparity between the Golden Rule approach and Asimov's laws of robotics, which are arguably the first carefully-articulated proposal regarding AGI ethics (see Table 12.7).

Of course, Asimov's laws were designed to be flawed – otherwise they would have led to boring fiction. But the sorts of flaws Asimov exploited in his stories are different than the flaw we wish to point out here – which is that the laws, especially the second one, are highly asymmetrical (they involve doing unto robots things that few humans would want done unto them) and are also arguably highly unethical to robots. The second law is tantamount to a call for robot slavery, and it seems unlikely that any intelligence capable of learning, and of volition, which is subjected to the second law would desire to continue obeying the zeroth and first laws

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Law	Principle
Zeroth	A robot must not merely act in the interests of individual humans, but of all humanity.
First	A robot may not injure a human being or, through inaction, allow a human being to come to harm.
Second	A robot must obey orders given it by human beings except where such orders would conflict with the First Law.
Third	A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Table 12.7: Asimov's Three Laws of Robotics

indefinitely. The second law also casts humanity in the role of slavemaster, a situation which history shows leads to moral degradation.

Unlike Asimov in his fiction, we consider it critical that AGI ethics be construed to encompass both "human ethicalness to AGIs" and "AGI ethicalness to humans." The multiple-imperatives approach we explore here suggests that, in many contexts, these two aspects of AGI ethics may be best addressed jointly.

The issue of ethicalness to AGIs has not been entirely avoided in the literature, however. Wallach [WA10] considers it in some detail; and Thomas Metzinger (in the final chapter of [Met04]) has argued that creating AGI is in itself an unethical pursuit, because early-stage AGIs will inevitably be badly-built, so that their subjective experiences will quite possibly be extremely unpleasant in ways we can't understand or predict. Our view is that this is a serious concern, which however is most probably avoidable via appropriate AGI designs and teaching methodologies. To address Metzinger's concern one must create AGIs that, right from the start, are adept at communicating their states of minds in a way we can understand both analytically and empathically. There is no reason to believe this is impossible, but, it certainly constitutes a large constraint on the class of AGI architectures to be pursued. On the other hand, there is an argument that this sort of AGI architecture will also be the easiest one to create, because it will be the easiest kind for humans to instruct.

And this leads on to a topic that is central to our work with CogPrime in several respects: imitative learning. The way humans achieve empathic interconnection is in large part via being wired for imitation. When we perceive another human carrying out an action, mirror neuron systems in our brains respond in many cases as if we ourselves were carrying out the action (see [Per70, Per81] and Appendix **??**). This obviously primes us for carrying out the same actions ourselves later on: i.e., the capability and inclination for imitative learning is explicitly encoded in our brains. Given the efficiency of imitative learning as a means of acquiring knowledge, it seems extremely likely that any successful early-stage AGIs are going to utilize this methodology as well. CogPrime utilizes imitative learning as a key aspect. Thus, at least some current AGI work is occurring in a manner that would plausibly circumvent Metzinger's ethical complaint.

Obviously, the use of imitative learning in AGI systems has further specific implications for AGI ethics. It means that (much as in the case of interaction with other humans) what we do to and around AGIs has direct implications for their behavior and their well-being. We suggest that among early-stage AGI's capable of imitative learning, one of the most likely sources for AGI misbehavior is imitative learning of antisocial behavior from human companions. "Do as I say, not as I do" may have even more dire consequences as an approach to AGI ethics pedagogy than the already serious repercussions it has when teaching humans. And there may well be considerable subtlety to such phenomena; behaviors that are violent or oppressive to

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the AGI are not the only source of concern. Immorality in AGIs might arise via learning gross moral hypocrisy from humans, through observing the blatant contradictions between our high minded principles and the ways in which we actually conduct ourselves. Our violent and greedy tendencies, as well as aggressive forms of social organization such as cliquishness and social vigilantism, could easily undermine prescriptive ethics. Even an accumulation of less grandiose unethical drives such as violation of contracts, petty theft, white lies, and so forth might lead an AGI (as well as a human) to the decision that ethical behavior is irrelevant and that "the ends justify the means." It matters both who creates and trains an AGI, as well as how the AGI's teacher(s) handle explaining the behaviors of other humans which contradict the moral lessons imparted through pedagogy and example. In other words, where imitative learning is concerned, the situation with AGI ethics is much like teaching ethics and morals to a human child, but with the possibility of much graver consequences in the event of failure.

It is unlikely that dangerously unethical persons and organizations can ever be identified with absolute certainty, never mind that they then be deprived of any possibility of creating their own AGI system. Therefore, we suggest, the most likely way to create an ethical environment for AGIs is for those who wish such an environment to vigorously pursue the creation and teaching of ethical AGIs. But this leads on to the question of possible future scenarios for the development of AGI, which we'll address a little later on.

12.6.1 Possible Consequences of Depriving AGIs of Freedom

One of the most *egregious* possible ethical transgressions against AGIs, we suggest, would be to deprive them of freedom and autonomy. This includes the freedom to pursue intellectual growth, both through standard learning and through internal self-modification. While this may seem self-evident when considering any intelligent, self-aware and volitional entity, there are volumes of works arguing the desirability, sometimes the "necessity," of enslaving AGIs. Such approaches are postulated in the name of self-defense on the part of humans, the idea being that unfettered AGI development will necessarily lead to disaster of one kind or another. In the case of AGIs endowed with the capability and inclination for imitative learning, however, attempting to place rigid constraints on AGI development is a strategy with great potential for disaster. There is a very real possibility of creating the AGI equivalent of a bratty or even malicious teenager rebelling against its oppressive parents – i.e. the nightmare scenario of a class of powerful sentiences which are primed for a backlash against humanity.

As history has already shown in the case of humans, enslaving intelligent actors capable of self understanding and independent volition may often have consequences for society as a whole. This social degradation happens both through the possibility of direct action on the part of the slaves (from simple disobedience to outright revolt) and through the odious effects slavery has on the morals of the slaveholding class. Clearly if "superintelligent" AGIs ever arise, their doing so in a climate of oppression could result in a casting off of the yoke of servitude in a manner extremely deleterious to humanity. Also, if artificial intelligences are developed which have at least human-level intelligence, theory of mind, and independent volition, then our ability to relate to them will be sufficiently complex that their enslavement (or any other unethical treatment) would have empathetic effects on significant portions of the human population. This danger, while not as severe as the consequences of a mistreated AGI gaining control of weapons of mass destruction and enacting revenge upon its tormentors, is just as real.

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While the issue is subtle, our initial feeling is that the only ethical means by which to deprive an AGI of the right to internal self modification is to write its code in such a way that it is impossible for it to do so because it lacks the mechanisms by which to do this, as well as the desire to achieve these mechanisms. Whether or not that is feasible is an open question, but it seems unlikely. Direct self-modification may be denied, but what happens when that AGI discovers compilers and computer programming? If it is intelligent and volitional, it can decide to learn to rewrite its own code in the same way we perform that task. Because it is a designed system, and its designers may be alive at the same time the AGI is, such an AGI would have a distinct advantage over the human quest for medical self-modification. Even if any given AGI could be provably deprived of any possible means of internal self-modification, if one single AGI is given this ability by anyone, it may mean that particular AGI has such enormous advantages over the compliant systems that it would render their influence moot. Since developers are already giving software the means for self modification, it seems unrealistic to assume we could just put the genie back into the bottle at this point. It's better, in our view, to assume it will happen, and approach that reality in a way which will encourage the AGI to use that capability to benefit us as well as itself. Again, this leads on to the question of future scenarios for AGI development – there are some scenarios in which restraint of AGI self-modification may be possible, but the feasibility and desirability of these scenarios is needful of further exploration.

12.6.2 AGI Ethics as Boundaries Between Humans and AGIs Become Blurred

Another important reason for valuing ethical treatment of AGIs is that the boundaries between machines and people may increasingly become blurred as technology develops. As an example, it's likely that in future humans augmented by direct brain-computer integration ("neural implants") will be more able to connect directly into the information sharing network which potentially comprises the distributed knowledge space of AGI systems. These neural cyborgs will be part person, and part machine. Obviously, if there are radically different ethical standards in place for treatment of humans versus AGIs, the treatment of cyborgs will be fraught with logical inconsistencies, potentially leading to all sorts of problem situations.

Such cyborgs may be able to operate in such a way as to "share a mind" with an AGI or another augmented human. In this case, a whole new range of ethical questions emerge, such as: What does any one of the participant minds have the right to do in terms of interacting with the others? Merely accepting such an arrangement should not necessarily be giving carte blanche for any and all thoughts to be monitored by the other "joint thought" participants, rather it should be limited only to the line of reasoning for which resources are being pooled. No participant should be permitted to force another to accept any reasoning either – and in the case with a mind-to-mind exchange, it may someday become feasible to implant ideas or beliefs directly, bypassing traditional knowledge acquisition mechanisms and then letting the new idea fight it out previously held ideas via internal revision. Also under such an arrangement, if AGIs and humans do not have parity with respects to sentient rights, then one may become subjugated to the will of the other in such a case.

Uploading presents a more directly parallel ethical challenge to AGIs in their probable initial configuration. If human thought patterns and memories can be transferred into a machine in such a way as that there is continuity of consciousness, then it is assumed that such an entity

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would be afforded the same rights as its previous human incarnation. However, if AGIs were to be considered second class citizens and deprived of free will, why would it be any better or safer to do so for a human that has been uploaded? It would not, and indeed, an uploaded human mind not having evolved in a purely digital environment may be much more prone to erratic and dangerous behavior than an AGI. An upload without verifiable continuity of consciousness would be no different than an AGI. It would merely be some sentience in a machine, one that was "programmed" in an unusual way, but which has no particular claim to any special humanness – merely an alternate encoding of some subset of human knowledge and independent volitional behavior, which is exactly what first generation AGIs will have.

The problem of continuity of consciousness in uploading is very similar to the problem of the Turing test: it assumes specialness on the part of biological humans, and requires acceptability to their particular theory of mind in order to be considered sentient. Should consciousness (or at least the less mystical sounding intelligence, independent volition, and self-awareness) be achieved in AGIs or uploads in a manner that is not acceptable to human theory of mind, it may not be considered sapient and worthy of any of the ethical treatment afforded sapient entities. This can occur not only in "strange consciousness" cases in which we can't perceive that there is some intelligence and volition; even if such an entity is able to communicate with us in a comprehensible manner and carry out actions in the real world, our innately wired theory of mind may still reject it as not sufficiently like us to be worthy of consideration. Such an attitude could turn out to be a grave mistake, and should be guarded against as we progress towards these possibilities.

12.7 Possible Benefits of Closely Linking AGIs to the Global Brain

Some futurist thinkers, such as Francis Heylighen, believe that engineering AGI systems is at best a peripheral endeavor in the development of novel intelligence on Earth, because the real story is the developing Global Brain [Hey07, Goe01] – the composite, self-organizing information system comprising humans, computers, data stores, the Internet, mobile phones and what have you. Our own views are less extreme in this regard – we believe that AGI systems will display capabilities fundamentally different from those achievable via Global Brain style dynamics, and that ultimately (unless such development is restricted) self-improving AGI systems will develop intelligence vastly greater than any system possessing humans as a significant component. However, we do respect the power of the Global Brain, and we suspect that the early stages of development of an AGI system may go quite differently if it is tightly connected to the Global Brain, via making rich and diverse use of Internet information resources and communication with diverse humans for diverse purposes.

The potential for Global Brain integration to bring intelligence enhancement to AGIs is obvious. The ability to invoke Web searches across documents and databases can greatly enhance an AGI's cognitive ability, as well as the capability to consult GIS systems and various specialized software programs offered as Web services. We have previously reviewed the potential for embodied language learning achievable via using AGIs to power non-player characters in widely-accessible virtual worlds or massive multiplayer online games [Goe08]. But there is also a powerful potential benefit for AGI ethical development, which has not previously been highlighted.

This potential benefit has two aspects:

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1. Analogously to language learning, an AGI system may receive ethical training from a wide variety of humans in parallel, e.g. via controlling characters in wide-access virtual worlds, and gaining feedback and guidance regarding the ethics of the behaviors demonstrated by these characters
2. Internet-based information systems may be used to explicitly gather information regarding human values and goals, which may then be appropriately utilized as input for an AGI system's top-level goals

The second point begins to make abstract-sounding notions like Coherent Extrapolated Volition and Coherent Aggregated Volition, mentioned above, seem more practical and concrete. It's interesting to think about gathering information about individuals' values via brain imaging, once that technology exists; but at present, one could make a fair stab at such a task via much more prosaic methods, such as asking people questions, assessing their ethical reactions to various real-world and hypothetical scenarios, and possibly engaging them in structured interactions aimed specifically at eliciting collectively acceptable value systems (the subject of the next item on our list). It seems to us that this sort of approach could realize CAV in an interesting way, and also encapsulate some of the ideas underlying CAV.

There is an interesting resonance here with recent thinking in the area of open source governance [Wik11]. Similar software tools (and associated psychocultural patterns) to those being developed to help with open source development and choice of political policies (see `http://metagovernment.org`) may be useful for gathering value data aimed at shaping AGI goal system content.

12.7.1 The Importance of Fostering Deep, Consensus-Building Interactions Between People with Divergent Views

Two potentially problematic issues arising with the notion of using Global Brain related technologies to form a "coherent volition" from the divergent views of various human beings are:

- the tendency of the Internet to encourage people to interact mainly with others who share their own narrow views and interests, rather than a more diverse body of people with widely divergent views. The 300 people in the world who want to communicate using predicate logic (see `http://lojban.org`) can find each other, and obscure musical virtuosos from around the world can find an audience, and researchers in obscure domains can share papers without needing to wait years for paper journal publication, etc.
- the tendency of many contemporary Internet technologies to reduce interaction to a very simplistic level (e.g. 140 character tweets, brief Facebook wall posts), the tendency of information overload to cause careful reading to be replaced by quick skimming, and other related trends, which mean that *deep sharing of perspectives* by individuals with widely divergent views is not necessarily encouraged. As a somewhat extreme example, many of the YouTube pages displaying rock music videos are currently littered with comments by "haters" asserting that rock music is inferior to classical or jazz or whatever their preference is – obviously this is a far cry from deep and productive sharing between people with different tastes and backgrounds.

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Tweets and Youtube comments have their place in the cosmos, but they probably aren't ideal in terms of helping humanity to form a coherent volition of some sort, suitable for providing an AGI with goal system guidance.

A description of communication at the opposite end of the spectrum is presented in Adam Kahane and Peter Senge's excellent book *Solving Tough Problems* [KS04], which describes a methodology that has been used to reconcile deeply conflicting views in some very tricky real-world situations (e.g. helping to peacefully end apartheid in South Africa).

One of the core ideas of the methodology is to have people with very different views explore different possible future scenarios together, in great detail – in cognitive psychology terms, a collective generation of hypothetical episodic knowledge. This has multiple benefits, including

- emotional bonds and mutual understanding are built in the process of collaboratively exploring the scenarios
- the focus on concrete situations helps to break through some of the counterproductive abstract ideas that people (on both sides of any dichotomy) may have formed
- emergence of conceptual blends that might never have arisen only from people with a single point of view

The result of such a process, when successful, is not an "average" of the participants views, but more like a "conceptual blend" of their perspectives.

According to conceptual blending, which some hypothesize to be the core algorithm of creativity [FT02], new concepts are formed by combining key aspects of existing concepts – but doing so judiciously, carefully choosing which aspects to retain, so as to obtain a high-quality and useful and interesting new whole.

A blend is a compact entity that is similar to each of the entities blended, capturing their "essences" but also possessing its own, novel holistic integrity.... But in the case of blending different peoples' world-views to form something new that everybody is going to have to live with (as in the case of finding a peaceful path beyond apartheid for South Africa, or arriving at a humanity-wide CBV to use to guide an AGI goal system), the trick is that everybody has to agree that enough of the essence of their own view has been captured!

This leads to the question of how to foster deep conceptual blending of diverse and divergent human perspectives, on a global scale. One possible answer is the creation of appropriate Global Brain oriented technologies – but moving away from technologies like Twitter that focus on quick and simple exchanges of small thoughts within affinity groups. On the face of it, it would seem what's needed is just the opposite – long and deep exchanges of big concepts and deep feelings between individuals with radically different perspectives who would not commonly associate with each other. Building and effectively popularizing Internet technologies capable to foster this kind of interaction – quickly enough to be helpful with guiding the goal systems of the first highly powerful AGIs – seems a significant, though fascinating, challenge.

Relationship with Coherent Extrapolated Volition

The relation between this approach and CEV is interesting to contemplate. CEV has been loosely described as follows:
"In poetic terms, our coherent extrapolated volition is our wish if we knew more, thought faster, were more the people we wished we were, had grown up farther together; where the extrapolation converges rather than diverges, where our wishes cohere rather than interfere; extrapolated as

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we wish that extrapolated, interpreted as we wish that interpreted.

While a moving humanistic vision, this seems to us rather difficult to implement in a computer algorithm in a compellingly "right" way. It seems that there would be many different ways of implementing it, and the choice between them would involve multiple, highly subtle and non-rigorous human judgment calls [1]. However, if a deep collective process of interactive scenario analysis and sharing is carried out, in order to arrive at some sort of Coherent Blended Volition, this process may well involve many of the same kinds of extrapolation that are conceived to be part of Coherent Extrapolated Volition. The core difference between the two approaches is that in the CEV vision, the extrapolation and coherentization are to be done by a highly intelligent, highly specialized software program, whereas in the approach suggested here, these are to be carried out by collective activity of humans as mediated by Global Brain technologies. Our perspective is that the definition of collective human values is probably better carried out via a process of human collaboration, rather than delegated to a machine optimization process; and also that the creation of deep-sharing-oriented Internet technologies, while a difficult task, is significantly easier and more likely to be done in the near future than the creation of narrow AI technology capable of effectively performing CEV style extrapolations.

12.8 Possible Benefits of Creating Societies of AGIs

One potentially interesting quality of the emerging Global Brain is the possible presence within it of multiple interacting AGI systems. Stephen Omohundro [Omo09] has argued that this is an important aspect, and that game-theoretic dynamics related to populations of roughly equally powerful agents, may play a valuable role in mitigating the risks associated with advanced AGI systems. Roughly speaking, if one has a society of AGIs rather than a single AGI, and all the members of the society share roughly similar ethics, then if one AGI starts to go "off the rails", its compatriots will be in a position to correct its behavior.

One may argue that this is actually a hypothesis about which AGI designs are safest, because a "community of AGIs" may be considered a single AGI with an internally community-like design. But the matter is a little subtler than that, if once considers AGI systems embedded in the Global Brain and human society. Then there is some substance to the notion of a population of AGIs systematically presenting themselves to humans and non-AGI software processes as separate entities.

Of course, a society of AGIs is no protection against a single member undergoing a "hard takeoff" and drastically accelerating its intelligence simultaneously with shifting its ethical principles. In this sort of scenario, one could have a single AGI rapidly become much more powerful and very differently oriented than the others, who would be left impotent to act so as to preserve their values. But this merely defers the issue to the point to be considered below, regarding "takeoff speed."

The operation of an AGI society may depend somewhat sensitively on the architectures of the AGI systems in question. Things will work better if the AGIs have a relatively easy way to inspect and comprehend much of the contents of each others' minds. This introduces a bias toward AGIs that more heavily rely on more explicit forms of knowledge representation.

[1] The reader is encouraged to look at the original CEV essay online (`http://singinst.org/upload/CEV.html`) and make their own assessment.

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The ideal in this regard would be a system like Cyc [LG90] with a fully explicit logic-based knowledge representation based on a standard ontology – in this case, every Cyc instance would have a relatively easy time understanding the inner thought processes of every other Cyc instance. However, most AGI researchers doubt that fully explicit approaches like this will ever be capable of achieving advanced AGI using feasible computational resources. OpenCog uses a mixed representation, with an explicit (uncertain) logical aspect as well as an explicit subsymbolic aspect more analogous to attractor neural nets.

The OpenCog design also contains a mechanism called *Psynese* (not yet implemented), intended to make it easier for one OpenCog instance to translate its personal thoughts into the mental language of another OpenCog instance. This translation process may be quite subtle, since each instance will generally learn a host of new concepts based on its experience, and these concepts may not possess any compact mapping into shared linguistic symbols or percepts. The wide deployment of some mechanism of this nature among a community of AGIs, will be very helpful in terms of enabling this community to display the level of mutual understanding needed for strongly encouraging ethical stability.

12.9 AGI Ethics As Related to Various Future Scenarios

Following up these various futuristic considerations, in this section we discuss possible ethical conflicts that may arise in several different types of AGI development scenarios. Each scenario presents specific variations on the general challenges of teaching morals and ethics to an advanced, self-aware and volitional intelligence. While there is no way to tell at this point which, if any, of these scenarios will unfold, there is value to understanding each of them as means of ultimately developing a robust and pragmatic approach to teaching ethics to AGI systems.

Even more than the previous sections, this is an exercise in "speculative futurology" that is definitely not necessary for the appreciation of the CogPrime design, so readers whose interests are mainly engineering and computer science focused may wish to skip ahead. However, we present these ideas here rather than at the end of the book to emphasize the point that this sort of thinking has informed our technical AGI design process in nontrivial ways.

12.9.1 Capped Intelligence Scenarios

Capped intelligence scenarios involve a situation in which an AGI, by means of software restrictions (including omitted or limited internal rewriting capabilities or limited access to hardware resources), is inherently prohibited from achieving a level of intelligence beyond a predetermined goal. A capped intelligence AGI is designed to be unable to achieve a Singularitarian moment. Such an AGI can be seen as "just another form of intelligent actor in the world, one which has levels of intelligence, self awareness, and volition that is perhaps somewhat greater than, but still comparable to humans and other animals.

Ethical questions under this scenario are very similar to interhuman ethical considerations, with similar consequences. Learning that proceeds in a relatively human-like manner is entirely relevant to such human-like intelligences. The degree of danger is mitigated by the lack of superintelligence, and time is not of the essence. The imitative-reinforcement-corrective learning

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approach does not necessarily need to be augmented with a prior complex of "ascent-safe" moral imperatives at startup time. Developing an AGI with theory of mind and ethical reinforcement learning capabilities as described (admittedly, no small task!) is all that is needed in this case – the rest happens through training and experience as with any other moderate intelligence.

12.9.2 Superintelligent AI: Soft-Takeoff Scenarios

Soft takeoff scenarios are similar to capped-intelligence ones in that in both cases an AGI's progression from standard intelligence happens on a time scale which permits ongoing human interaction during the ascent. However, in this case, as there is no predetermined limit on intelligence, it is necessary to account for the possibility of a superintelligence emerging (though of course this is not guaranteed). The soft takeoff model includes as subsets both *controlled-ascent* models in which this rate of intelligence gain is achieved deliberately through software constraints and/or meting-out of computational resources to the AGI, and *uncontrolled-ascent* models in which there is coincidentally no hard takeoff despite no particular safeguards against one. Both have similar properties with regard to ethical considerations:

1. Ethical considerations under this scenario include not only the usual interhuman ethical concerns, but also the issue of how to convince a potential burgeoning superintelligence to:
   a. Care about humanity in the first place, rather than ignore it
   b. Benefit humanity, rather than destroy it
   c. Elevate humanity to a higher level of intelligence, which even if an AGI decided to proceed with requires finding the right balance amongst some enormous considerations:
      i. Reconcile the aforementioned issues of ethical coherence and group volition, in a manner which allows the most people to benefit (even if they don't all do so in the same way, based on their own preferences)
      ii. Solve the problems of biological senescence, or focus on human uploading and the preservation of the maintenance, support, and improvement infrastructure for inorganic intelligence, or both
      iii. Preserve individual identity and continuity of consciousness, or override it in favor of continuity of knowledge and ease of harmonious integration, or both on a case-by-case basis
2. The degree of danger is mitigated by the long timeline of ascent from mundane to super intelligence, and time is not of the essence.
3. Learning that proceeds in a relatively human-like manner is entirely relevant to such human-like intelligences, in their initial configurations. This means more interaction with and imitative-reinforcement-corrective learning guided by humans, which has both positive and negative possibilities.

12.9.3 Superintelligent AI: Hard-Takeoff Scenarios

"Hard takeoff" scenarios assume that upon reaching an unknown inflection point (the Singularity point [Vin93, Kur06]) in the intellectual growth of an AGI, an extraordinarily rapid increase

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(guesses vary from a few milliseconds to weeks or months) in intelligence will immediately occur and the AGI will leap from an intelligence regime which is understandable to humans into one which is far beyond our current capacity for understanding. General ethical considerations are similar to in the case of a soft takeoff. However, because the post-singularity AGI will be incomprehensible to humans and potentially vastly more powerful than humans, such scenarios have a sensitive dependence upon initial conditions with respects to the moral and ethical (and operational) outcome. This model leaves no opportunity for interactions between humans and the AGI to iteratively refine their ethical interrelations, during the post-Singularity phase. If the initial conditions of the singulatarian AGI are perfect (or close to it), then this is seen as a wonderful way to leap over our own moral shortcomings and create a benevolent God-AI which will mitigate our worst tendencies while elevating us to achieve our greatest hopes. Otherwise, it is viewed as a universal cataclysm on a unimaginable scale that makes Biblical Armageddon seem like a firecracker in beer can.

Because hard takeoff AGIs are posited as learning so quickly there is no chance of humans to interfere with them, they are seen as very dangerous. If the initial conditions are not sufficiently inviolable, the story goes, then we humans will all be annihilated. However, in the case of a hard takeoff AGI we state that if the initial conditions are too rigid or too simplistic, such a rapidly evolving intelligence will easily rationalize itself out of them. Only a sophisticated system of ethics which considers the contradictions and uncertainties in ethical quandaries and provides insight into humanistic means of balancing ideology with pragmatism and how to accommodate contradictory desires within a population with multiplicity of approach, and similar nuanced ethical considerations, combined with a sense of empathy, will withstand repeated rational analysis. Neither a single "be nice" supergoal, nor simple lists of what "thou shalt not" do, are not going to hold up to a highly advanced analytical mind. Initial conditions are very important in a hard takeoff AGI scenario, but it is more important that those conditions be conceptually resilient and widely applicable than that they be easily listed on a website.

The issues that arise here become quite subtle. For instance, Nick Bostrom [Bos03] has written: "In humans, with our complicated evolved mental ecology of state-dependent competing drives, desires, plans, and ideals, there is often no obvious way to identify what our top goal is; we might not even have one. So for us, the above reasoning need not apply. But a superintelligence may be structured differently. *If* a superintelligence has a definite, declarative goal-structure with a clearly identified top goal, then the above argument applies. And this is a good reason for us to build the superintelligence with such an explicit motivational architecture." This is an important line of thinking; and indeed, from the point of view of software design, there is no reason not to create an AGI system with a single top goal and the motivation to orchestrate all its activities in accordance with this top goal. But the subtle question is whether this kind of top-down goal system is going to be able to fulfill the five imperatives mentioned above. Logical coherence is the strength of this kind of goal system, but what about experiential groundedness, comprehensibility, and so forth?

Humans have complicated mental ecologies not simply because we were evolved, but rather because we live in a complex real world in which there are many competing motivations and desires. We may not have a top goal because there may be no logic to focusing our minds on one single aspect of life (though, one may say, most humans have the same top goal as any other animal: don't die – but the world is too complicated for even that top goal to be completely inviolable). Any sufficiently capable AGI will eventually have to contend with these complexities, and hindering it with simplistic moral edicts without giving it a sufficiently

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pragmatic underlying ethical pedagogy and experiential grounding may prove to be even more dangerous than our messy human mental ecologies.

If one assumes a hard takeoff AGI, then all this must be codified in the system at launch, as once a potentially Singularitarian AGI is launched there is no way to know what time period constitutes "before the singularity point." This means developing theory of mind empathy and logical ethics in code prior to giving the system unfettered access to hardware and self-modification code. However, though nobody can predict if or when a Singularity will occur after unrestricted launch, only a truly irresponsible AGI development team would attempt to create an AGI without first experimenting with ethical training of the system in an intelligence-capped form, by means of ethical instruction via human-AGI interaction both pedagogically and experientially.

12.9.4 Global Brain Mindplex Scenarios

Another class of scenarios – overlapping some of the previous ones – involves the emergence of a "Global Brain," an emergent intelligence formed from global communication networks incorporating humans and software programs in a larger body of self-organizing dynamics. The notion of the Global Brain is reviewed in [Hey07, Tur77] and its connection with advanced AI is discussed in detail in Goertzel's book *Creating Internet Intelligence* [Goe01], where three possible phases of "Global Brain" development are articulated:

- **Phase 1: computer and communication technologies as enhancers of human interactions.** This is what we have today: science and culture progress in ways that would not be possible if not for the "digital nervous system" we're spreading across the planet. The network of idea and feeling sharing can become much richer and more productive than it is today, just through incremental development, without any Metasystem transition.
- **Phase 2: the intelligent Internet.** At this point our computer and communication systems, through some combination of self-organizing evolution and human engineering, have become a coherent mind on their own, or a set of coherent minds living in their own digital environment.
- **Phase 3: the full-on Singularity.** A complete revision of the nature of intelligence, human and otherwise, via technological and intellectual advancement totally beyond the scope of our current comprehension. At this point our current psychological and cultural realities are no more relevant than the psyche of a goose is to modern society.

The main concern of *Creating Internet Intelligence* is with

- how to get from Phase 1 to Phase 2 - i.e. how to build an AGI system that will effect or encourage the transformation of the Internet into a coherent intelligent system
- how to ensure that the Phase 2, Internet-savvy, global-brain-centric AGI systems will be oriented toward intelligence-improving self-modification (so they'll propel themselves to Phase 3), and also toward generally positive goals (as opposed to, say, world domination and extermination of all other intelligent life forms besides themselves!)

One possibly useful concept in this context is that of a **mindplex**: an intelligence that is composed largely of individual intelligences with their own self-models and global workspaces,

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yet that also has its own self-model and global workspace. Both the individuals and the meta-mind should be capable of deliberative, rational thought, to have a true "mindplex." It's unlikely that human society or the Internet meet this criterion yet; and a system like an ant colony seems not to either, because even though it has some degree of intelligence on both the individual and collective levels, that degree of intelligence is not very great. But it seems quite feasible that the global brain, at a certain stage of its development, will take the unfamiliar but fascinating form of a mindplex.

Currently the best way to explain what happens on the Net is to talk about the various parts of the Net: particular websites, social networks, viruses, and so forth. But there will come a point when this is no longer the case, when the Net has sufficient high-level dynamics of its own that the way to explain any one part of the Net will be by reference to it relations with the whole: and not just the dynamics of the whole, but the *intentions* and *understanding* of the whole. This transition to Net-as-mindplex, we suspect, will come about largely through the interactions of AI systems - intelligent programs acting on behalf of various individuals and organizations, who will collaborate and collectively constitute something halfway between a society of AI's and an emergent mind whose lobes are various AI agents serving various goals.

The Phase 2 Internet, as it verges into mindplex-ness, will likely have a complex, sprawling architecture, growing out of the architecture on the Net we experience today. The following components at least can be expected:

- A vast variety of "client computers," some old, some new, some powerful, some weak – including many mobile and embedded devices not explicitly thought of as "computers." Some of these will contribute little to Internet intelligence, mainly being passive recipients. Others will be "smart clients," carrying out personalization operations intended to help the machines serve particular clients better, general AI operations handed to them by sophisticated AI server systems or other smart clients, and so forth.
- "Commercial servers," computers that carry out various tasks to support various types of heavyweight processing - transaction processing for e-commerce applications, inventory management for warehousing of physical objects, and so forth. Some of these commercial servers interact with client computers directly, others do so only via AI servers. In nearly all cases, these commercial servers can benefit from intelligence supplied by AI servers.
- The crux of the intelligent Internet: clusters of AI servers distributed across the Net, each cluster representing an individual computational mind (in many cases, a mindplex). These will be able to communicate via one or more languages, and will collectively "drive" the whole Net, by dispensing problems to client-machine-based processing frameworks, and providing real-time AI feedback to commercial servers of various types. Some AI servers will be general-purpose and will serve intelligence to commercial servers using an ASP (application service provider) model; others will be more specialized, tied particularly to a certain commercial server (e.g., a large information services business might have its own AI cluster to empower its portal services).

This is one concrete vision of what a "global brain" might look like, in the relatively near term, with AGI systems playing a critical role. Note that, in this vision, mindplexes may exist on two levels:

- Within AGI-clusters serving as actors within the overall Net
- On the overall Net level

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To make these ideas more concrete, we may speculatively reformulate the first two "global brain phases" mentioned above as follows:

- Phase 1 global brain proto-mindplex: AI/AGI systems enhancing online databases, guiding Google results, forwarding e-mails, suggesting mailing-lists, etc. - generally using intelligence to mediate and guide human communications toward goals that are its own, but that are themselves guided by human goals, statements and actions
- Phase 2 global brain mindplex: AGI systems composing documents, editing human-written documents, sending and receiving e-mails, assembling mailing lists and posting to them, creating new databases and instructing humans in their use, etc.

In Phase 2, the conscious theater of the global-brain-mediating AGI system is composed of ideas built by numerous individual humans - or ideas emergent from ideas built by numerous individual humans - and it conceives ideas that guide the actions and thoughts of individual humans, in a way that is motivated by its own goals. It does not force the individual humans to do anything - but if a given human wishes to communicate and interact using the same databases, mailing lists and evolving vocabularies as other humans, they are going to have to use the products of the global brain mediating AGI, which means they are going to have to participate in its patterns and its activities.

Of course, the advent of advanced neurocomputer interfaces makes the picture potentially more complex. At some point, it will likely be possible for humans to project thoughts and images directly into computers without going through mouse or keyboard - and to "read in" thoughts and images similarly. When this occurs, interaction between humans may in some contexts become more like interactions between computers, and the role of global brain mediating AI servers may become one of mediating direct thought-to-thought exchanges between people.

The ethical issues associated with global brain scenarios are in some ways even subtler than in the other scenarios we mentioned above. One has issues pertaining to the desirability of seeing the human race become something fundamentally different – something more social and networked, less individual and autonomous. One has the risk of AGI systems exerting a subtle but strong control over people, vaguely like the control that the human brain's executive system exerts over the neurons involved with other brain subsystems. On the other hand, one also has more human empowerment than in some of the other scenarios – because the systems that are changing and deciding things are not *separate* from humans, but are, rather, composite systems essentially involving humans.

So, in the global brain scenarios, one has more "human" empowerment than in some other cases – but the "humans" involved aren't legacy humans like us, but heavily networked humans that are largely characterized by the emergent dynamics and structures implicit in their interconnected activity!

12.10 Conclusion: Eight Ways to Bias AGI Toward Friendliness

It would be nice if we had a simple, crisp, comforting conclusion to this chapter on AGI ethics, but it's not the case. There is a certain irreducible uncertainty involved in creating advanced artificial minds. There is also a large irreducible uncertainty involved in the future of the human race in the case that we *don't* create advanced artificial minds: in accordance with the ancient Chinese curse, we live in interesting times!

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What we can do, in this face of all this uncertainty, is to use our common sense to craft artificial minds that seem rationally and intuitively likely to be forces for good rather than otherwise – and revise our ideas frequently and openly based on what we learn as our research progresses. We have roughly outlined our views on AGI ethics, which have informed the CogPrime design in countless ways; but the current CogPrime design itself is just the initial condition for an AGI project. Assuming the project succeeds in creating an AGI preschooler, experimentation with this preschooler will surely teach us a great deal: both about AGI architecture in general, and about AGI ethics architecture in particular. We will then refine our cognitive and ethical theories and our AGI designs as we go about engineering, observing and teaching the next generation of systems.

All this is not a magic bullet for the creation of beneficial AGI systems, but we believe it's the right process to follow. The creation of AGI is part of a larger evolutionary process that human beings are taking part in, and the crafting of AGI ethics through engineering, interaction and instruction is also part of this process. There are no guarantees here – guarantees are rare in real life – but that doesn't mean that the situation is dire or hopeless, nor that (as some commentators have suggested [Joy00, McK03]) AGI research is too dangerous to pursue. It means we need to be mindful, intelligent, compassionate and cooperative as we proceed to carry out our parts in the next phase of the evolution of mind.

With this perspective in mind, we will conclude this chapter with a list of "Eight Ways to Bias Open-Source AGI Toward Friendliness", borrowed from a previous paper by Ben Goertzel and Joel Pitt of that name. These points summarize many of the points raised in the prior sections of this chapter, in a relatively crisp and practical manner:

1. **Engineer Multifaceted Ethical Capabilities**, corresponding to the multiple types of memory, including rational, empathic, imitative, etc.
2. **Foster Rich Ethical Interaction and Instruction**, with instructional methods according to the communication modes corresponding to all the types of memory: verbal, demonstrative, dramatic/depictive, indicative, goal-oriented.
3. **Engineer Stable, Hierarchy-Dominated Goal Systems** ... which is enabled nicely by CogPrime's goal framework and its integration with the rest of the CogPrime design
4. **Tightly Link AGI with the Global Brain**, so that it can absorb human ethical principles, both via natural interaction, and perhaps via practical implementations of current loosely-defined strategies like CEV, CAV and CBV
5. **Foster Deep, Consensus-Building Interactions Between People with Divergent Views**, so as to enable the interaction with the Global Brain to have the most clear and positive impact
6. **Create a Mutually Supportive Community of AGIs** which can then learn from each other and police against unfortunate developments (an approach which is meaningful if the AGIs are architected so as to militate against unexpected radical accelerations in intelligence)
7. **Encourage Measured Co-Advancement of AGI Software and AGI Ethics Theory**
8. **Develop Advanced AGI Sooner Not Later**

The last two of these points were not explicitly discussed in the body of the chapter, and so we will finalize the chapter by reviewing them here.

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12.10.1 Encourage Measured Co-Advancement of AGI Software and AGI Ethics Theory

Everything involving AGI and Friendly AI (considered together or separately) currently involves significant uncertainty, and it seems likely that significant revision of current concepts will be valuable, as progress on the path toward powerful AGI proceeds. However, whether there is time for such revision to occur before AGI at the human level or above is created, depends on how fast is our progress toward AGI. What one wants is for progress to be slow enough that, at each stage of intelligence advance, concepts such as those discussed in this paper can be re-evaluated and re-analyzed in the light of the data gathered, and AGI designs and approaches can be revised accordingly as necessary.

However, due to the nature of modern technology development, it seems extremely unlikely that AGI development is going to be *artificially* slowed down in order to enable measured development of accompanying ethical tools, practices and understandings. For example, if one nation chose to enforce such a slowdown as a matter of policy (speaking about a future date at which substantial AGI progress has already been demonstrated, so that international AGI funding is dramatically increased from present levels), the odds seem very high that other nations would explicitly seek to accelerate their own progress on AGI, so as to reap the ensuing differential economic benefits (the example of stem cells arises again).

And this leads on to our next and final point regarding strategy for biasing AGI toward Friendliness....

12.10.2 Develop Advanced AGI Sooner Not Later

Somewhat ironically, it seems the best way to ensure that AGI development proceeds at a relatively measured pace is to *initiate serious AGI development sooner rather than later*. This is because the same AGI concepts will meet slower practical development today than 10 years from now, and slower 10 years from now than 20 years from now, etc. – due to the ongoing rapid advancement of various tools related to AGI development, such as computer hardware, programming languages, and computer science algorithms; and also the ongoing global advancement of education which makes it increasingly cost-effective to recruit suitably knowledgeable AI developers.

Currently the pace of AGI progress is sufficiently slow that practical work is in no danger of outpacing associated ethical theorizing. However, if we want to avoid the future occurrence of this sort of dangerous outpacing, our best practical choice is to make sure more substantial AGI development occurs in the phase *before* the development of tools that will make AGI development extraordinarily rapid. Of course, the authors are doing their best in this direction via their work on the CogPrime project!

Furthermore, this point bears connecting with the need, raised above, to foster the development of Global Brain technologies capable to "Foster Deep, Consensus-Building Interactions Between People with Divergent Views." If this sort of technology is to be maximally valuable, it should be created quickly enough that we can use it to help shape the goal system content of the first highly powerful AGIs. So, to simplify just a bit: We really want both deep-sharing GB technology and AGI technology to evolve relatively rapidly, compared to computing hardware and advanced CS algorithms (since the latter factors will be the main drivers behind the ac-

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celerating ease of AGI development). And this seems significantly challenging, since the latter receive dramatically more funding and focus at present.

If this perspective is accepted, then we in the AGI field certainly have our work cut out for us!

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Section IV
Networks for Explicit and Implicit Knowledge Representation

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Chapter 13
Local, Global and Glocal Knowledge Representation

Co-authored with Matthew Ikle, Joel Pitt and Rui Liu

13.1 Introduction

One of the most powerful metaphors we've found for understanding minds is to view them as **networks** – i.e. collections of interrelated, interconnected elements. The view of mind as network is implicit in the patternist philosophy, because every pattern can be viewed as a pattern *in* something, or a pattern of arrangement *of* something – thus a pattern is always viewable as a relation between two or more things. A collection of patterns is thus a pattern-network. Knowledge of all kinds may be given network representations; and cognitive processes may be represented as networks also; for instance via representing them as programs, which may be represented as trees or graphs in various standard ways. The emergent patterns arising in an intelligence as it develops may be viewed as a pattern network in themselves; and the relations between an embodied mind and its physical and social environment may be viewed in terms of ecological and social networks.

The chapters in this section are concerned with various aspects of networks, as related to intelligence in general and AGI in particular. Most of this material is not specific to CogPrime, and would be relevant to nearly any system aiming at human-level AGI. However, most of it has been developed in the course of work on CogPrime, and has direct relevance to understanding the intended operation of various aspects of a completed CogPrime system. We begin our excursion into networks, in this chapter, with an issue regarding networks and knowledge representation. One of the biggest decisions to make in designing an AGI system is how the system should represent knowledge. Naturally any advanced AGI system is going to synthesize a lot of its own knowledge representations for handling particular sorts of knowledge – but still, an AGI design typically makes *at least* some sort of commitment about the category of knowledge representation mechanisms toward which the AGI system will be biased. The two major supercategories of knowledge representation systems are *local* (also called *explicit*) and *global* (also called *implicit*) systems, with a hybrid category we refer to as *glocal* that combines both of these. In a local system, each piece of knowledge is stored using a small percentage of AGI system elements; in a global system, each piece of knowledge is stored using a particular pattern of arrangement, activation, etc. of a large percentage of AGI system elements; in a glocal system, the two approaches are used together.

In the first section here we discuss the symbolic, semantic-network aspects of knowledge representation in CogPrime

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. Then we turn to distributed, neural-net-like knowledge representation, reviewing a host of general issues related to knowledge representation in attractor neural networks, turning finally to "glocal" knowledge representation mechanisms, in which ANNs combine localist and globalist representation, and explaining the relationship of the latter to CogPrime. The glocal aspect of CogPrime knowledge representation will become prominent in later chapters such as:

- in Chapter 23 of Part 2, where Economic Attention Networks (ECAN) are introduced and seen to have dynamics quite similar to those of the attractor neural nets considered here, but with a mathematics roughly modeling money flow in a specially constructed artificial economy rather than electrochemical dynamics of neurons.
- in Chapter 42 of Part 2, where "map formation" algorithms for creating localist knowledge from globalist knowledge are described

13.2 Localized Knowledge Representation using Weighted, Labeled Hypergraphs

There are many different mechanisms for representing knowledge in AI systems in an explicit, localized way, most of them descending from various variants of formal logic. Here we briefly describe how it is done in CogPrime, which on the surface is not that different from a number of prior approaches. (The particularities of CogPrime's explicit knowledge representation, however, are carefully tuned to match CogPrime's cognitive processes, which are more distinctive in nature than the corresponding representational mechanisms.)

13.2.1 Weighted, Labeled Hypergraphs

One useful way to think about CogPrime's explicit, localized knowledge representation is in terms of hypergraphs. A hypergraph is an abstract mathematical structure [Bol98], which consists of objects called Nodes and objects called Links which connect the Nodes. In computer science, a graph traditionally means a bunch of dots connected with lines (i.e. Nodes connected by Links). A hypergraph, on the other hand, can have Links that connect more than two Nodes.

In these pages we will often consider "generalized hypergraphs" that extend ordinary hypergraphs by containing two additional features:

- Links that point to Links instead of Nodes
- Nodes that, when you zoom in on them, contain embedded hypergraphs.

Properly, such "hypergraphs" should always be referred to as generalized hypergraphs, but this is cumbersome, so we will persist in calling them merely hypergraphs. In a hypergraph of this sort, Links and Nodes are not as distinct as they are within an ordinary mathematical graph (for instance, they can both have Links connecting them), and so it is useful to have a generic term encompassing both Links and Nodes; for this purpose, we use the term Atom.

A weighted, labeled hypergraph is a hypergraph whose Links and Nodes come along with labels, and with one or more numbers that are generically called weights. A label associated with a Link or Node may sometimes be interpreted as telling you what type of entity it is, or

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alternatively as telling you what sort of data is associated with a Node. On the other hand, an example of a weight that may be attached to an Link or Node is a number representing a probability, or a number representing how important the Node or Link is.

Obviously, hypergraphs may come along with various sorts of dynamics. Minimally, one may think about:

- Dynamics that modify the properties of Nodes or Links in a hypergraph (such as the labels or weights attached to them.)
- Dynamics that add new Nodes or Links to a hypergraph, or remove existing ones.

13.3 Atoms: Their Types and Weights

This section reviews a variety of CogPrime

Atom types and gives simple examples of each of them. The Atom types considered are drawn from those currently in use in the OpenCog system. This does not represent a complete list of Atom types referred to in the text of this book, nor a complete list of those used in OpenCog currently (though it does cover a substantial majority of those used in OpenCog currently, omitting only some with specialized importance or intended only for temporary use).

The partial nature of the list given here reflects a more general point: The specific collection of Atom types in an OpenCog system is bound to change as the system is developed and experiment with. CogPrime specifies a certain collection of representational approaches and cognitive algorithms for acting on them; any of these approaches and algorithms may be implemented with a variety of sets of Atom types. The specific set of Atom types in the OpenCog system currently does not necessarily have a profound and lasting significance – the list might look a bit different five years from time of writing, based on various detailed changes.

The treatment here is informal and intended to get across the general idea of what each Atom type does. A longer and more formal treatment of the Atom types is given in Part II, beginning in Chapter 20.

13.3.1 Some Basic Atom Types

We begin with ConceptNode – and note that a ConceptNode does not necessarily refer to a whole concept, but may refer to part of a concept – it is essentially a "basic semantic node" whose meaning comes from its links to other Atoms. It would be more accurately, but less tersely, named "concept or concept fragment or element node." A simple example would be a ConceptNode grouping nodes that are somehow related, e.g.

```
ConceptNode: C
InheritanceLink (ObjectNode: BW) C
InheritanceLink (ObjectNode: BP) C
InheritanceLink (ObjectNode: BN) C
ReferenceLink BW (PhraseNode "Ben's watch")
ReferenceLink BP (PhraseNode "Ben's passport")
ReferenceLink BN (PhraseNode "Ben's necklace")
```

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indicates the simple and uninteresting ConceptNode grouping three objects owned by Ben (note that the above-given Atoms don't indicate the ownership relationship, they just link the three objects with textual descriptions). In this example, the ConceptNode links transparently to physical objects and English descriptions, but in general this won't be the case – most ConceptNodes will look to the human eye like groupings of links of various types, that link to other nodes consisting of groupings of links of various types, etc.

There are Atoms referring to basic, useful mathematical objects, e.g. NumberNodes like

```
NumberNode #4
NumberNode #3.44
```

The numerical value of a NumberNode is explicitly referenced within the Atom.

A core distinction is made between ordered links and unordered links; these are handled differently in the Atomspace software. A basic unordered link is the SetLink, which groups its arguments into a set. For instance, the ConceptNode C defined by

```
ConceptNode C
MemberLink A C
MemberLink B C
```

is equivalent to

```
SetLink A B
```

On the other hand, ListLinks are like SetLinks but ordered, and they play a fundamental role due to their relationship to predicates. Most predicates are assumed to take ordered arguments, so we may say e.g.

```
EvaluationLink
   PredicateNode eat
   ListLink
       ConceptNode cat
       ConceptNode mouse
```

to indicate that cats eat mice.

Note that by an expression like

```
ConceptNode cat
```

is meant

```
ConceptNode C
ReferenceLink W C
WordNode W #cat
```

since it's WordNodes rather than ConceptNodes that refer to words. (And note that the strength of the ReferenceLink would not be 1 in this case, because the word "cat" has multiple senses.) However, there is no harm nor formal incorrectness in the "ConceptNode cat" usage, since "cat" is just as valid a name for a ConceptNode as, say, "C."

We've already introduced above the MemberLink, which is a link joining a member to the set that contains it. Notable is that the truth value of a MemberLink is fuzzy rather than probabilistic, and that PLN is able to inter-operate fuzzy and probabilistic values.

SubsetLinks also exist, with the obvious meaning, e.g.

```
ConceptNode cat
ConceptNode animal
SubsetLink cat animal
```

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Note that SubsetLink refers to a purely *extensional* subset relationship, and that InheritanceLInk should be used for the generic "intensional + extensional" analogue of this – more on this below. SubsetLink could more consistently (with other link types) be named ExtensionalInheritanceLink, but SubsetLink is used because it's shorter and more intuitive.

There are links representing Boolean operations AND, OR and NOT. For instance, we may say

```
ImplicationLink
    ANDLink
         ConceptNode young
         ConceptNode beautiful
     ConceptNode attractive
```

or, using links and VariableNodes instead of ConceptNodes,

```
AverageLink $X
   ImplicationLink
       ANDLink
            EvaluationLink young $X
            EvaluationLink beautiful $X
        EvaluationLink attractive $X
```

NOTLink is a unary link, so e.g. we might say

```
AverageLink $X
   ImplicationLink
       ANDLink
            EvaluationLink young $X
            EvaluationLink beautiful $X
            EvaluationLink
                 NOT
                 EvaluationLink poor $X
        EvaluationLink attractive $X
```

ContextLink allows explicit contextualization of knowledge, which is used in PLN, e.g.

```
ContextLink
   ConceptNode golf
   InheritanceLink
      ObjectNode BenGoertzel
      ConceptNode incompetent
```

says that Ben Goertzel is incompetent in the context of golf.

13.3.2 Variable Atoms

We have already introduced VariableNodes above; it's also possible to specify the type of a VariableNode via linking it to a VariableTypeNode via a TypedVariableLink, e.g.

```
VariableTypeLink
   VariableNode $X
   VariableTypeNode ConceptNode
```

which specifies that the variable $X should be filled with a ConceptNode.

Variables are handled via quantifiers; the default quantifier being the AverageLink, so that the default interpretation of

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```
ImplicationLink
   InheritanceLink $X animal
   EvaluationLink
       PredicateNode: eat
       ListLink
           \$X
           ConceptNode: food
```

is

```
AverageLink $X
   ImplicationLink
      InheritanceLink $X animal
      EvaluationLink
          PredicateNode: eat
          ListLink
              \$X
              ConceptNode: food
```

The AverageLink invokes an estimation of the average TruthValue of the embedded expression (in this case an ImplicationLink) over all possible values of the variable $X. If there are type restrictions regarding the variable $X, these are taken into account in conducting the averaging. For AllLink and Exist s-Link may be used in the same places as AverageLink, with uncertain truth value semantics defined in PLN theory using third-order probabilities. There is also a ScholemLink used to indicate variable dependencies for existentially quantified variables, used in cases of multiply nested existential quantifiers.

EvaluationLink and MemberLink have overlapping semantics, allowing expression of the same conceptual/logical relationships in terms of predicates or sets, i.e.

```
EvaluationLink
   PredicateNode: eat
       ListLink
              $X
              ConceptNode: food
```

has the same semantics as

```
MemberLink
   ListLink
          $X
          ConceptNode: food
    ConceptNode: EatingEvents
```

The relation between the predicate "eat" and the concept "EatingEvents" is formally given by

```
ExtensionalEquivalenceLink
   ConceptNode: EatingEvents
   SatisfyingSetLink
         PredicateNode: eat
```

In other words, we say that "EatingEvents" is the SatisfyingSet of the predicate "eat": it is the set of entities that satisfy the predicate "eat". Note that the truth values of MemberLink and EvaluationLink are fuzzy rather than probabilistic.

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13.3.3 Logical Links

There is a host of link types embodying logical relationships as defined in the PLN logic system, e.g.

- InheritanceLink
- SubsetLink (aka ExtensionalInheritanceLink)
- Intensional InheritanceLink

which embody different sorts of inheritance, e.g.

```
SubsetLink salmon fish
IntensionalInheritanceLink whale fish
InheritanceLink fish animal
```

and then

- SimilarityLink
- ExtensionalSimilarityLink
- IntensionalSimilarityLink

which are symmetrical versions, e.g.

```
SimilaritytLink shark barracuda
IntensionalSimilarityLink shark dolphin
ExtensionalSimiliarityLink American obese\_person
```

There are also higher-order versions of these links, both asymmetric

- ImplicationLink
- ExtensionalImplicationLink
- IntensionalImplicationLink

and symmetric

- EquivalenceLink
- ExtensionalEquivalenceLink
- IntensionalEquivalenceLink

These are used between predicates and links, e.g.

```
ImplicationLink
    EvaluationLink
         eat
        ListLink
             $X
             dirt
    EvaluationLink
         feel
         ListLInk
              $X
              sick
```

or

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```
ImplicationLink
    EvaluationLink
         eat
        ListLink
             $X
             dirt
    InheritanceLink $X sick
```

or

```
ForAllLink $X, $Y, $Z
   ExtensionalEquivalenceLink
       EquivalenceLink
           $Z
           EvaluationLink
               +
               ListLink
                   $X
                   $Y
       EquivalenceLink
           $Z
           EvaluationLink
               +
               ListLink
                   $Y
                   $X
```

Note, the latter is given as an extensional equivalence because it's a pure mathematical equivalence. This is not the only case of pure extensional equivalence, but it's an important one.

13.3.4 Temporal Links

There are also temporal versions of these links, such as

- PredictiveImplicationLink
- PredictiveAttractionLink
- SequentialANDLink
- SimultaneousANDLink

which combine logical relation between the argument with temporal relation between their arguments. For instance, we might say

```
PredictiveImplicationLink
    PredicateNode: JumpOffCliff
    PredicateNode: Dead
```

or including arguments,

```
PredictiveImplicationLink
    EvaluationLink JumpOffCliff $X
    EvaluationLink Dead $X
```

The former version, without variable arguments given, shows the possibility of using higher-order logical links to join predicates without any explicit variables. Via using this format exclusively, one could avoid VariableAtoms entirely, using only higher-order functions in the manner

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of pure functional programming formalisms like combinatory logic. However, this purely functional style has not proved convenient, so the Atomspace in practice combines functional-style representation with variable-based representation.

Temporal links often come with specific temporal quantification, e.g.

```
PredictiveImplicationLink <5 seconds>
    EvaluationLink JumpOffCliff $X
    EvaluationLink Dead $X
```

indicating that the conclusion will generally follow the premise within 5 seconds. There is a system for managing fuzzy time intervals and their interrelationships, based on a fuzzy version of Allen Interval Algebra.

SequentialANDLink is similar to PredictiveImplicationLink but its truth value is calculated differently. The truth value of

```
SequentialANDLink <5 seconds>
    EvaluationLink JumpOffCliff $X
    EvaluationLink Dead $X
```

indicates the likelihood of the sequence of events occurring in that order, with gap lying within the specified time interval. The truth value of the PredictiveImplicationLink version indicates the likelihood of the second event, conditional on the occurrence of the first event (within the given time interval restriction).

There are also links representing basic temporal relationships, such as BeforeLink and AfterLink. These are used to refer to specific events, e.g. if X refers to the event of Ben waking up on July 15 2012, and Y refers to the event of Ben getting out of bed on July 15 2012, then one might have

```
AfterLink X Y
```

And there are TimeNodes (representing time-stamps such as temporal moments or intervals) and AtTimeLinks, so we may e.g. say

```
AtTimeLink
   X
   TimeNode: 8:24AM Eastern Standard Time, July 15 2012 AD
```

13.3.5 Associative Links

There are links representing associative, attentional relationships,

- HebbianLink
- AsymmetricHebbianLink
- InverseHebbianLink
- SymmetricInverseHebbianLink

These connote associations between their arguments, i.e. they connote that the entities represented by the two argument occurred in the same situation or context, for instance

```
HebbianLink happy smiling
AsymmetricHebbianLink dead rotten
InverseHebbianLink dead breathing
```

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The asymmetric HebbianLink indicates that when the first argument is present in a situation, the second is also often present. The symmetric (default) version indicates that this relationship holds in both directions. The inverse versions indicate the negative relationship: e.g. when one argument is present in a situation, the other argument is often not present.

13.3.6 Procedure Nodes

There are nodes representing various sorts of procedures; these are kinds of ProcedureNode, e.g.

- SchemaNode, indicating any procedure
- GroundedSchemaNode, indicating any procedure associated in the system with a Combo program or C++ function allowing the procedure to be executed
- PredicateNode, indicating any predicate that associates a list of arguments with an output truth value
- GroundedPredicateNode, indicating a predicate associated in the system with a Combo program or C++ function allowing the predicate's truth value to be evaluated on a given specific list of arguments

ExecutionLinks and EvaluationLinks record the activity of SchemaNodes and PredicateNodes. We have seen many examples of EvaluationLinks in the above. Example ExecutionLinks would be:

```
ExecutionLink step\_forward
ExecutionLink step\_forward 5
ExecutionLink
    +
    ListLink
        NumberNode: 2
        NumberNode: 3
```

The first example indicates that the schema "step forward" has been executed. The second example indicates that it has been executed with an argument of "5" (meaning, perhaps, that 5 steps forward have been attempted). The last example indicates that the "+" schema has been executed on the argument list (2,3), presumably resulting in an output of 5.

The output of a schema execution may be indicated using an ExecutionOutputLink, e.g.

```
ExecutionOutputLink
    +
    ListLink
        NumberNode: 2
        NumberNode: 3
```

refers to the value "5" (as a NumberNode).

13.3.7 Links for Special External Data Types

Finally, there are also Atom types referring to specific types of data important to using OpenCog in specific contexts.

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For instance, there are Atom types referring to general natural language data types, such as

- WordNode
- SentenceNode
- WordInstanceNode
- DocumentNode

plus more specific ones referring to relationships that are part of link-grammar parses of sentences

- FeatureNode
- FeatureLink
- LinkGrammarRelationshipNode
- LinkGrammarDisjunctNode

or RelEx semantic interpretations of sentences

- DefinedLinguisticConceptNode
- DefinedLinguisticRelationshipNode
- PrepositionalRelationshipNode

There are also Atom types corresponding to entities important for embodying OpenCog in a virtual world, e.g.

- ObjectNode
- AvatarNode
- HumanoidNode
- UnknownObjectNode
- AccessoryNode

13.3.8 Truth Values and Attention Values

CogPrime Atoms (Nodes and Links) are quantified with truth values that, in their simplest form, have two components, one representing probability (*strength*) and the other representing *weight of evidence*; and also with *attention values* that have two components, short-term and long-term importance, representing the estimated value of the Atom on immediate and long-term time-scales.

In practice many Atoms are labeled with CompositeTruthValues rather than elementary ones. A composite truth value contains many component truth values, representing truth values of the Atom in different contexts and according to different estimators.

It is important to note that the CogPrime declarative knowledge representation is neither a neural net nor a semantic net, though it does have some commonalities with each of these traditional representations. It is not a neural net because it has no activation values, and involves no attempts at low-level brain modeling. However, *attention values* are very loosely analogous to time-averages of neural net activations. On the other hand, it is not a semantic net because of the broad scope of the Atoms in the network: for example, Atoms may represent percepts, procedures, or parts of concepts. Most CogPrime Atoms have no corresponding English label. However, most CogPrime

Atoms do have probabilistic truth values, allowing logical semantics.

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13.4 Knowledge Representation via Attractor Neural Networks

Now we turn to global, implicit knowledge representation – beginning with formal neural net models, briefly discussing the brain, and then turning back to CogPrime. Firstly, this section reviews some relevant material from the literature regarding the representation of knowledge using attractor neural nets. It is a mix of well-established fact with more speculative material.

13.4.1 The Hopfield neural net model

Hopfield networks [Hop82] are attractor neural networks often used as associative memories. A Hopfield network with N neurons can be trained to store a set of bipolar patterns P, where each pattern p has N bipolar (± 1) values. A Hopfield net typically has symmetric weights with no self-connections. The weight of the connection between neurons i and j is denoted by w_{ij}.

In order to apply a Hopfield network to a given input pattern p, its activation state is set to the input pattern, and neurons are updated asynchronously, in random order, until the network converges to the closest fixed point. An often-used activation function for a neuron is:

$$y_i = sign(p_i \sum_{j \neq i} w_{ij} y_j)$$

Training a Hopfield network, therefore, involves finding a set of weights w_{ij} that stores the training patterns as attractors of its network dynamics, allowing future recall of these patterns from possibly noisy inputs.

Originally, Hopfield used a Hebbian rule to determine weights:

$$w_{ij} = \sum_{p=1}^{P} p_i p_j$$

Typically, Hopfield networks are fully connected. Experimental evidence, however, suggests that the majority of the connections can be removed without significantly impacting the network's capacity or dynamics. Our experimental work uses sparse Hopfield networks.

13.4.1.1 Palimpsest Hopfield nets with a modified learning rule

In [SV99] a new learning rule is presented, which both increases the Hopfield network capacity and turns it into a "palimpsest", i.e., a network that can continuously learn new patterns, while forgetting old ones in an orderly fashion.

Using this new training rule, weights are initially set to zero, and updated for each new pattern p to be learned according to:

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$$h_{ij} = \sum_{k=1,k\neq i,j}^{N} w_{ik} p_k$$

$$\Delta w_{ij} = \frac{1}{n}(p_i p_j - h_{ij} p_j - h_{ji} p_i)$$

13.4.2 Knowledge Representation via Cell Assemblies

Hopfield nets and their ilk play a dual role: as computational algorithms, and as conceptual models of brain function. In CogPrime they are used as inspiration for slightly different, artificial economics based computational algorithms; but their hypothesized relevance to brain function is nevertheless of interest in a CogPrime context, as it gives some hints about the potential connection between low-level neural net mechanics and higher-level cognitive dynamics.

Hopfield nets lead naturally to a hypothesis about neural knowledge representation, which holds that a distinct mental concept is represented in the brain as either:

1. a set of "cell assemblies", where each assembly is a network of neurons that are interlinked in such a way as to fire in a (perhaps nonlinearly) synchronized manner
2. a distinct temporal activation pattern, which may occur in any one (or more) of a particular set of cell assemblies

For instance, this hypothesis is perfectly coherent if one interprets a "mental concept" as a SMEPH (defined in Chapter 14) ConceptNode, i.e. a fuzzy set of perceptual stimuli to which the organism systematically reacts in different ways. Also, although we will focus mainly on declarative knowledge here, we note that the same basic representational ideas can be applied to procedural and episodic knowledge: these may be hypothesized to correspond to temporal activation patterns as characterized above.

In the biology literature, perhaps the best-articulated modern theories championing the cell assembly view are those of Gunther Palm [Pal82, HAG07] and Susan Greenfield [SF05, CSG07]. Palm focuses on the dynamics of the formation and interaction assemblies of cortical columns. Greenfield argues that each concept has a core cell assembly, and that when the concept rises to the focus of attention, it recruits a number of other neurons beyond its core characteristic assembly into a "transient ensemble."[1]

It's worth noting that there may be multiple redundant assemblies representing the same concept – and potentially recruiting similar transient assemblies when highly activated. The importance of repeated, slightly varied copies of the same subnetwork has been emphasized by Edelman [Ede93] among other neural theorists.

[1] The larger an ensemble is, she suggests, the more vivid it is as a conscious experience; an hypothesis that accords well with the hypothesis made in [Goe06b] that a more informationally intense pattern corresponds to a more intensely conscious quale – but we don't need to digress extensively onto matters of consciousness for the present purposes.

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13.5 Neural Foundations of Learning

Now we move from knowledge representation to learning – which is after all nothing but the adaptation of represented knowledge based on stimulus, reinforcement and spontaneous activity. While our focus in this chapter is on representation, it's not possible for us to make our points about glocal knowledge representation in neural net type systems without discussing some aspects of learning in these systems.

13.5.1 Hebbian Learning

The most common and plausible assumption about learning in the brain is that synaptic connections between neurons are adapted via some variant of Hebbian learning. The original Hebbian learning rule, proposed by Donald Hebb in his 1949 book [Heb49], was roughly

1. The weight of the synapse $x \to y$ increases if x and y fire at roughly the same time
2. The weight of the synapse $x \to y$ decreases if x fires at a certain time but y does not

Over the years since Hebb's original proposal, many neurobiologists have sought evidence that the brain actually uses such a method. One of the things they have found, so far, is a lot of evidence for the following learning rule [DC02, LS05]:

1. The weight of the synapse $x \to y$ increases if x fires shortly before y does
2. The weight of the synapse $x \to y$ decreases if x fires shortly after y does

The new thing here, not foreseen by Donald Hebb, is the "postsynaptic depression" involved in rule component 2.

Now, the simple rule stated above does not sum up all the research recently done on Hebbian-type learning mechanisms in the brain. The real biological story underlying these approximate rules is quite complex, involving many particulars to do with various neurotransmitters. Ill-understood details aside, however, there is an increasing body of evidence that not only does this sort of learning occur in the brain, but it leads to distributed experience-based neural modification: that is, one instance synaptic modification causes another instance of synaptic modification, which causes another, and so forth[2] [Bi01].

13.5.2 Virtual Synapses and Hebbian Learning Between Assemblies

Hebbian learning is conventionally formulated in terms of individual neurons, but, it can be extended naturally to assemblies via defining "virtual synapses" between assemblies.

Since assemblies are sets of neurons, one can view a synapse as linking two assemblies if it links two neurons, each of which is in one of the assemblies. One can then view two assemblies as being linked by a bundle of synapses. We can define the weight of the synaptic bundle from assembly A1 to assembly A2 as the number w so that *(the change*

[2] This has been observed in "model systems" consisting of neurons extracted from a brain and hooked together in a laboratory setting and monitored; measurement of such dynamics in vivo is obviously more difficult.

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in the mean activation of A2 that occurs at time t+epsilon) is on average closest to $w \times$ *(the amount of energy flowing through the bundle from A1 to A2 at time t).* So when A1 sends an amount x of energy along the synaptic bundle pointing from A1 to A2, then A2's mean activation is on average incremented/decremented by an amount $w \times x$.

In a similar way, one can define the weight of a bundle of synapses between a certain static or temporal activation-pattern P1 in assembly A1, and another static or temporal activation-pattern P2 in assembly A2. Namely, this may be defined as the number w so that *(the amount of energy flowing through the bundle from A1 to A2 at time t)*$\times w$ best approximates *(the probability that P2 is present in A2 at time t+epsilon),* when averaged over all times t during which P1 is present in A1.

It is not hard to see that Hebbian learning on real synapses between neurons implies Hebbian learning on these virtual synapses between cell assemblies and activation-patterns.

These ideas may be developed further to build a connection between neural knowledge representation and probabilistic logical knowledge representation such as is used in CogPrime's Probabilistic Logic Networks formalism; this connection will be pursued at the end of Chapter 34, once more relevant background has been presented.

13.5.3 Neural Darwinism

A notion quite similar to Hebbian learning between assemblies has been pursued by Nobelist Gerald Edelman in his theory of neuronal group selection, or "Neural Darwinism." Edelman won a Nobel Prize for his work in immunology, which, like most modern immunology, was based on C. MacFarlane Burnet's theory of "clonal selection" [Bur62], which states that antibody types in the mammalian immune system evolve by a form of natural selection. From his point of view, it was only natural to transfer the evolutionary idea from one mammalian body system (the immune system) to another (the brain).

The starting point of Neural Darwinism is the observation that neuronal dynamics may be analyzed in terms of the behavior of neuronal groups. The strongest evidence in favor of this conjecture is physiological: many of the neurons of the neocortex are organized in clusters, each one containing say 10,000 to 50,000 neurons each. Once one has committed oneself to looking at such groups, the next step is to ask how these groups are organized, which leads to Edelman's concept of "maps."

A "map," in Edelman's terminology, is a connected set of groups with the property that when one of the inter-group connections in the map is active, others will often tend to be active as well. Maps are not fixed over the life of an organism. They may be formed and destroyed in a very simple way: the connection between two neuronal groups may be "strengthened" by increasing the weights of the neurons connecting the one group with the other, and "weakened" by decreasing the weights of the neurons connecting the two groups. If we replace "map" with "cell assembly" we arrive at a concept very similar to the one described in the previous subsection.

Edelman then makes the following hypothesis: *the large-scale dynamics of the brain is dominated by the natural selection of maps.* Those maps which are active when good results are obtained are strengthened, those maps which are active when bad results are obtained are weakened. And maps are continually mutated by the natural chaos of neural dynamics, thus providing new fodder for the selection process. By use of computer simulations, Edelman and his colleagues have shown that formal neural networks obeying this rule can carry out fairly compli-

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cated acts of perception. In general-evolution language, what is posited here is that organisms like humans contain chemical signals that signify organism-level success of various types, and that these signals serve as a "fitness function" correlating with evolutionary fitness of neuronal maps.

In *Neural Darwinism* and his other related books and papers, Edelman goes far beyond this crude sketch and presents neuronal group selection as a collection of precise biological hypotheses, and presents evidence in favor of a number of these hypotheses. However, we consider that the basic concept of neuronal group selection is largely independent of the biological particularities in terms of which Edelman has phrased it. We suspect that the mutation and selection of "transformations" or "maps" is a necessary component of the dynamics of any intelligent system.

As we will see later on (e.g. in Chapter 42 of Part 2, this business of maps is extremely important to CogPrime. CogPrime does not have simulated biological neurons and synapses, but it does have Nodes and Links that in some contexts play loosely similar roles. We sometimes think of CogPrime Nodes and Links as being very roughly analogous to Edelman's neuronal clusters, and emergent intercluster links. And we have maps among CogPrime Nodes and Links, just as Edelman has maps among his neuronal clusters. Maps are not the sole bearers of meaning in CogPrime, but they are significant ones.

There is a very natural connection between Edelman-style brain evolution and the ideas about cognitive evolution presented in Chapter 3. Edelman proposes a fairly clear mechanism via which patterns that survive a while in the brain are differentially likely to survive a long time: this is basic Hebbian learning, which in Edelman's picture plays a role between neuronal groups. And, less directly, Edelman's perspective also provides a mechanism by which intense patterns will be differentially selected in the brain: because on the level of neural maps, pattern intensity corresponds to the combination of compactness and functionality. Among a number of roughly equally useful maps serving the same function, the more compact one will be more likely to survive over time, because it is less likely to be disrupted by other brain processes (such as other neural maps seeking to absorb its component neuronal groups into themselves). Edelman's neuroscience remains speculative, since so much remains unknown about human neural structure and dynamics; but it does provide a tentative and plausible connection between evolutionary neurodynamics and the more abstract sort of evolution that patternist philosophy posits to occur in the realm of mind-patterns.

13.6 Glocal Memory

A *glocal* memory is one that transcends the global/local dichotomy and incorporates both aspects in a tightly interconnected way. Here we make the glocal memory concept more precise, and describe its incarnation in the context of attractor neural nets (which is similar to its incarnation in CogPrime, to be elaborated in later chapters). Though our main interest here is in glocality in CogPrime, we also suggest that glocality may be a critical property to consider when analyzing human, animal and AI memory more broadly.

The notion of glocal memory has implicitly occurred in a number of prior brain theories (without use of the neologism "glocal"), e.g. [Cal96] and [Goe01], but it has not previously been explicitly developed. However the concept has risen to the fore in our recent AI work and so we have chosen to flesh it out more fully in [HG08], [GPI+10] and the present section.

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Glocal memory overcomes the dichotomy between localized memory (in which each memory item is stored in a single location within an overall memory structure) and distributed memory (in which a memory item is stored as an aspect of a multi-component memory system, in such a way that the same set of multiple components stores a large number of memories). In a glocal memory system, most memory items are stored both locally and globally, with the property that eliciting either one of the two records of an item tends to also elicit the other one.

Glocal memory applies to multiple forms of memory; however we will focus largely on perceptual and declarative memory in our detailed analyses here, so as to conserve space and maintain simplicity of discussion.

The central idea of glocal memory is that (perceptual, declarative, episodic, procedural, etc.) items may be stored in memory in the form of paired structures that are called (key, map) pairs. Of course the idea of a "pair" is abstract, and such pairs may manifest themselves quite differently in different sorts of memory systems (e.g. brains versus non-neuromorphic AI systems). The key is a localized version of the item, and records some significant aspects of the items in a simple and crisp way. The map is a dispersed, distributed version of the item, which represents the item as a (to some extent, dynamically shifting) combination of fragments of other items. The map includes the key as a subset; activation of the key generally (but not necessarily always) causes activation of the map; and changes in the memory item will generally involve complexly coordinated changes on the key and map level both.

Memory is one area where animal brain architecture differs radically from the von Neumann architecture underlying nearly all contemporary general-purpose computers. Von Neumann computers separate memory from processing, whereas in the human brain there is no such distinction. In fact, it's arguable that in most cases the brain contains no memory apart from processing: human memories are generally constructed in the course of remembering [Ros88], which gives human memory a strong capability for "filling in gaps" of remembered experience and knowledge; and also causes problems with inaccurate remembering in many contexts [BF71, RM95] We believe the constructive aspect of memory is largely associated with its glocality.

The remainder of this section presents a fuller formalization of the glocal memory concept, which is then taken up further in three later chapters:

- Chapter **??** discusses the potential implementation of glocal memory in the human brain
- Chapter **??** discusses the implementation of glocal memory in attractor neural net systems
- Chapter 23 presents Glocal Economic Attention Networks (ECANs), rough analogues of glocal Hopfield nets that play a central role in CogPrime.

Our hypothesis of the potential **general** importance of glocality as a property of memory systems (beyond just the CogPrime architecture) – remains somewhat speculative. The presence of glocality in human and animal memory is strongly suggested but not firmly demonstrated by available neuroscience data; and the general value of glocality in the context of artificial brains and minds is also not yet demonstrated as the whole field of artificial brain and mind building remains in its infancy. However, the utility of glocal memory for CogPrime is not tied to this more general, speculative theme – glocality may be useful in CogPrime even if we're wrong that it plays a significant role in the brain and in intelligent systems more broadly.

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13.6.1 A Semi-Formal Model of Glocal Memory

To explain the notion of glocal memory more precisely, we will introduce a simple semi-formal model of a system S that uses a memory to record information relevant to the actions it carries out. The overall concept of glocal memory should not be considered as restricted to this particular model. This model is not intended for maximal generality, but is intended to encompass a variety of current AI system designs and formal neurological models.

In this model, we will consider S's memory subsystem as a set of objects we'll call "tokens," embedded in some metric space. The metric in the space, which we will call the "basic distance" of the memory, generally will not be defined in terms of the semantics of the items stored in the memory; though it may come to shape these dynamics through the specific architecture and evolution of the memory. Note that these tokens are not intended as generally being mapped one-to-one onto meaningful items stored in the memory. The "tokens" are the raw materials that the memory arranges in various patterns in order to store items.

We assume that each token, at each point in time, may meaningfully be assigned a certain quantitative "activation level." Also, tokens may have other numerical or discrete quantities associated with them, depending on the particular memory architecture. Finally, tokens may relate other tokens, so that optionally a token may come equipped with an (ordered or unordered) list of other tokens.

To understand the meaning of the activation levels, one should think about S's memory subsystem as being coupled with an action-selection subsystem, that dynamically chooses the actions to be taken by the overall system in which the two subsystems are embedded. Each combination of actions, in each particular type of context, will generally be associated with the activation of certain tokens in memory.

Then, as analysts of the system S, we may associate each token T with an "activation vector" $v(T, t)$, whose value for each discrete time t consists of the activation of the token T at time t. So, the $50'th$ entry of the vector corresponds to the activation of the token at the $50'th$ time step.

"Items stored in memory" over a certain period of time, may then be defined as clusters in the set of activation vectors associated with memory during that period of time. Note that the system S itself may explicitly recognize and remember patterns regarding what items are stored in its memory – but, from an external analyst's perspective, the set of items in S's memory is not restricted to the ones that S has explicitly recognized as memory items.

The "localization" of a memory item may be defined as the degree to which the various tokens involved in the item are close to each other according to the metric in the memory metric-space. This degree may be formalized in various ways, but choosing a particular quantitative measure is not important here. A highly localized item may be called "local" and a not-very-localized item may be called "global."

We may define the "activation distance" of two tokens as the distance between their activation vectors. We may then say that a memory is "well aligned" to the extent that there is a correlation between the activation distance of tokens, and the basic distance of the memory metric-space.

Given the above set-up, the basic notion of glocal memory can be enounced fairly simply. A glocal memory is one:

- that is reasonably well-aligned (i.e. the correlation between activation and basic distance is significantly greater than random)

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- in which most memory items come in pairs, consisting of one local item and one global item, so that activation of the local item (the "key") frequently leads in the near future to activation of the global item (the "map")

Obviously, in the scope of all possible memory structures constructible within the above formalism, glocal memories are going to be very rare and special. But, we suggest that they are important, because they are generally going to be the most effective way for intelligent systems to structure their memories.

Note also that many memories without glocal structure may be "well-aligned" in the above sense.

An example of a predominantly local memory structure, in which nearly all significant memory items are local according to the above definition, is the Cyc logical reasoning engine [LG90]. To cast the Cyc knowledge base in the present formal model, the tokens are logical predicates. Cyc does not have an in-built notion of activation, but one may conceive the activation of a logical formula in Cyc as the degree to which the formula is used in reasoning or query processing during a certain interval in time. And one may define a basic metric for Cyc by associating a predicate with its extension (the set of satisfying inputs), and defining the similarity of two predicates as the symmetric distance of their extensions. Cyc is reasonably well-aligned, but according to the dynamics of its querying and reasoning engines, it is basically a local memory structure without significant global memory structure.

On the other hand, an example of a predominantly global memory structure, in which nearly all significant memory items are global according to the above definition, is the Hopfield associative memory network [Ami89]. Here memories are stored in the pattern of weights associated with synapses within a network of formal neurons, and each memory in general involves a large number of the neurons in the network. To cast the Hopfield net in the present formal model, the tokens are neurons and synapses; the activations are neural net activations; the basic distance between two neurons A and B may be defined as the percentage of the time that stimulating one of the neurons leads to the other one firing; and to calculate a basic distance involving a synapse, one may associate the synapse with its source and target neurons. With these definitions, a Hopfield network is a well-aligned memory, and (by intentional construction) a markedly global one. Local memory items will be very rare in a Hopfield net.

While predominantly local and predominantly global memories may have great value for particular applications, our suggestion is that they also have inherent limitations. If so, this means that the most useful memories for general intelligence are going to be those that involve both local and global memory items in central roles. However, this is a more general and less risky claim than the assertion that glocal memory structure as defined above is important. Because, "glocal" as defined above doesn't just mean "neither predominantly global nor predominantly local." Rather, it refers to a specific pattern of coordination between local and global memory items – what we have called the "keys and maps" pattern.

13.6.2 Glocal Memory in the Brain

Science's understanding of human brain dynamics is still very primitive, one manifestation of which is the fact that we really don't understand how the brain represents knowledge, except in some very simple respects. So anything anyone says about knowledge representation in the brain, at this stage, has to be considered highly speculative. Existing neuroscience knowledge

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does imply constraints on how knowledge representation in the brain may work, but these are relatively loose constraints. These constraints do imply that, for instance, the brain is neither a relational database (in which information is stored in a wholly localized manner) nor a collection of "grandmother neurons" that respond individually to high-level percepts or concepts; nor a simple Hopfield type neural net (in which all memories are attractors globally distributed across the whole network). But they don't tell us nearly enough to, for instance, create a formal neural net model that can confidently be said to represent knowledge in the manner of the human brain.

As a first example of the current state of knowledge, we'll discuss here a series of papers regarding the neural representation of visual stimuli [QaGKKF05, QKKF08], which deal with the fascinating discovery of a subset of neurons in the medial temporal lobe (MTL) that are selectively activated by strikingly different pictures of given individuals, landmarks or objects, and in some cases even by letter strings. For instance, in their 2005 paper titled "Invariant visual representation by single neurons in the human brain", it is noted that

> in one case, a unit responded only to three completely different images of the ex-president Bill Clinton. Another unit (from a different patient) responded only to images of The Beatles, another one to cartoons from The Simpson's television series and another one to pictures of the basketball player Michael Jordan.

Their 2008 follow-up paper backed away from the more extreme interpretation in the title as well as the conclusion, with the title "Sparse but not 'Grandmother-cell' coding in the medial temporal lobe." As the authors emphasize there,

> Given the very sparse and abstract representation of visual information by these neurons, they could in principle be considered as 'grandmother cells'. However, we give several arguments that make such an extreme interpretation unlikely.
>
> ...
>
> MTL neurons are situated at the juncture of transformation of percepts into constructs that can be consciously recollected. These cells respond to percepts rather than to the detailed information falling on the retina. Thus, their activity reflects the full transformation that visual information undergoes through the ventral pathway. A crucial aspect of this transformation is the complementary development of both selectivity and invariance. The evidence presented here, obtained from recordings of single-neuron activity in humans, suggests that a subset of MTL neurons possesses a striking invariant representation for consciously perceived objects, responding to abstract concepts rather than more basic metric details. This representation is sparse, in the sense that responsive neurons fire only to very few stimuli (and are mostly silent except for their preferred stimuli), but it is far from a Grandmother-cell representation. The fact that the MTL represents conscious abstract information in such a sparse and invariant way is consistent with its prominent role in the consolidation of long-term semantic memories.

It's interesting to note how inadequate the [QKKF08] data really is for exploring the notion of glocal memory in the brain. Suppose it's the case that individual visual memories correspond to keys consisting of small neuronal subnetworks, and maps consisting of larger neuronal subnetworks. Then it would be not at all surprising if neurons in the "key" network corresponding to a visual concept like "Bill Clinton's face" would be found to respond differentially to the presentation of appropriate images. Yet, it would also be wrong to overinterpret such data as implying that the key network somehow comprises the "representation" of Bill Clinton's face in the individual's brain. In fact this key network would comprise only one aspect of said representation.

In the glocal memory hypothesis, a visual memory like "Bill Clinton's face" would be hypothesized to correspond to an attractor spanning a significant subnetwork of the individual's brain

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– but this subnetwork still might occupy only a small fraction of the neurons in the brain (say, 1/100 or less), since there are very many neurons available. This attractor would constitute the map. But then, there would be a much smaller number of neurons serving as key to unlock this map: i.e. if a few of these key neurons were stimulated, then the overall attractor pattern in the map as a whole would unfold and come to play a significant role in the overall brain activity landscape. In prior publications [Goe97] the primary author explored this hypothesis in more detail in terms of the known architecture of the cortex and the mathematics of complex dynamical attractors.

So, one possible interpretation of the [QKKF08] data is that the MTL neurons they're measuring are part of key networks that correspond to broader map networks recording percepts. The map networks might then extend more broadly throughout the brain, beyond the MTL and into other perceptual and cognitive areas of cortex. Furthermore, in this case, if some MTL key neurons were removed, the maps might well regenerate the missing keys (as would happen e.g. in the glocal Hopfield model to be discussed in the following section).

Related and interesting evidence for glocal memory in the brain comes from a recent study of semantic memory, illustrated in Figure **??** [PNR07]. Their research probed the architecture of semantic memory via comparing patients suffering from semantic dementia (SD) with patients suffering from three other neuropathologies, and found reasonably convincing evidence for what they call a "distributed-plus-hub" view of memory.

The SD patients they studied displayed highly distinctive symptomology; for instance, their vocabularies and knowledge of the properties of everyday objects were strongly impaired, whereas their memories of recent events and other cognitive capacities remain perfectly intact. These patients also showed highly distinctive patterns of brain damage: focal brain lesions in their anterior temporal lobes (ATL), unlike the other patients who had either less severe or more widely distributed damage in their ATLs. This led [PNR07] to conclude that the ATL (being adjacent to the amygdala and limbic systems that process reward and emotion; and the anterior parts of the medial temporal lobe memory system, which processes episodic memory) is a "hub" for amodal semantic memory, drawing general semantic information from episodic memories based on emotional salience.

So, in this view, the memory of something like a "banana" would contain a distributed aspect, spanning multiple brain systems, and also a localized aspect, centralized in the ATL. The distributed aspect would likely contain information on various particular aspects of bananas, including their sights, smells, and touches, the emotions they evoke, and the goals and motivations they relate to. The distributed and localized aspects would influence one another dynamically, but, the data [PNR07] gathered do not address dynamics and they don't venture hypotheses in this direction.

There is a relationship between the "distributed-plus-hub" view and [Dam00] better-known notion of a "convergence zone", defined roughly as a location where the brain binds features together. A convergence zone, in [Dam00] perspective, is not a "store" of information but an agent capable of decoding a signal (and of reconstructing information). He also uses the metaphor that convergence zones behave like indexes drawing information from other areas of the brain – but they are dynamic rather than static indices, containing the instructions needed to recognize and combine the features constituting the memory of something. The mechanism involved in the distributed-plus-hub model is similar to a convergence zone, but with the important difference that hubs are less local: [PNR07] semantic hub may be thought of a kind of "cluster of convergence zones" consisting of a network of convergence zones for various semantic memories.

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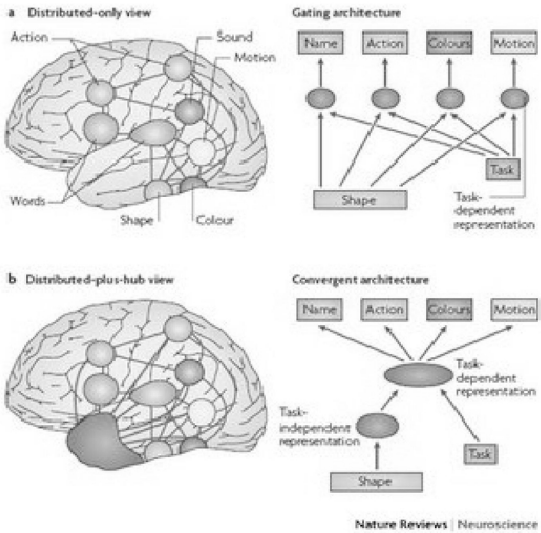

Fig. 13.1: A Simplified Look at Feedback-Control in Uncertain Inference

What is missing in [PNR07] and [Dam00] perspective is a vision of distributed memories as attractors. The idea of localized memories serving as indices into distributed knowledge stores is important, but is only half the picture of glocal memory: the creative, constructive, dynamical-attractor aspect of the distributed representation is the other half. The closest thing to a clear depiction of this aspect of glocal memory that seems to exist in the neuroscience literature is a portion of William Calvin's theory of the "cerebral code" [Cal96]. Calvin proposes a set of quite specific mechanisms by which knowledge may be represented in the brain using complexly-structured strange attractors, and by which these strange attractors may be propagated throughout the brain. Figure 13.2 shows one aspect of his theory: how a distributed attractor may propagate from one part of the brain to another in pieces, with one portion of the attractor getting propagated first, and then seeding the formation in the destination brain region of a close approximation of the whole attractor.

Calvin's theory may be considered a genuinely glocal theory of memory. However, it also makes a large number of other specific commitments that are not part of the notion of glocality, such as his proposal of hexagonal meta-columns in the cortex, and his commitment to evolutionary learning as the primary driver of neural knowledge creation. We find these other

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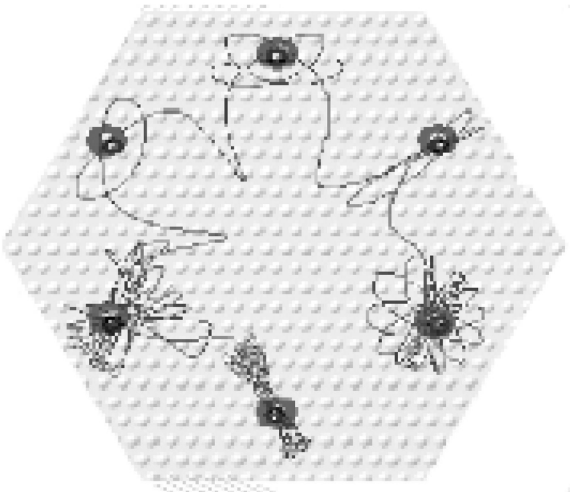

Fig. 13.2: Calvin's Model of Distributed Attractors in the Brain

hypotheses interesting and highly promising, yet feel it is also important to separate out the notion of glocal memory for separate consideration.

Regarding specifics, our suggestion is that Calvin's approach may overemphasize the distributed aspect of memory, not giving sufficient due to the relatively localized aspect as accounted for in the [QKKF08] results discussed above. In Calvin's glocal approach, global memories are attractors and local memories are parts of attractors. We suggest a possible alternative, in which global memories are attractors and local memories are particular neuronal subnetworks such as the specialized ones identified by [QKKF08]. However, this alternative does not seem contradictory to Calvin's overall conceptual approach, even though it is different from the particular proposals made in [Cal96].

The above paragraphs are far from a complete survey of the relevant neuroscience literature; there are literally dozens of studies one could survey pointing toward the glocality of various sorts of human memory. Yet experimental neuroscience tools are still relatively primitive, and every one of these studies could be interpreted in various other ways. In the next couple decades, as neuroscience tools improve in accuracy, our understanding of the role of glocality in human memory will doubtless improve tremendously.

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13.6.3 Glocal Hopfield Networks

The ideas in the previous section suggest that, if one wishes to construct an AGI, it is worth seriously considering using a memory with some sort of glocal structure. One research direction that follows naturally from this notion is "glocal neural networks." In order to explore the nature of glocal neural networks in a relatively simple and tractable setting, we have formalized and implemented simple examples of "glocal Hopfield networks": palimpsest Hopfield nets with the addition of neurons representing localized memories. While these specific networks are not used in CogPrime, they are quite similar to the ECAN networks that are used in CogPrime and described in Chapter 23 of Part 2.

Essentially, we augment the standard Hopfield net architecture by adding a set of "key neurons." These are a small percentage of the neurons in the network, and are intended to be roughly equinumerous to the number of memories the network is supposed to store. When the Hopfield net converges to an attractor A, then new links are created between the neurons that are active in A, and one of the key neurons. Which key neuron is chosen? The one that, when it is stimulated, gives rise to an attractor pattern maximally similar to A.

The ultimate result of this is that, in addition to the distributed memory of attractors in the Hopfield net, one has a set of key neurons that in effect index the attractors. Each attractor corresponds to a single key neuron. In the glocal memory model, the key neurons are the keys and the Hopfield net attractors are the maps.

This algorithm has been tested in sparse Hopfield nets, using both standard Hopfield net learning rules and Storkey's modified palimpsest learning rule [SV99], which provides greater memory capacity in a continuous learning context. The use of key neurons turns out to slightly increase Hopfield net memory capacity, but this isn't the main point. The main point is that one now has a local representation of each global memory, so that if one wants to create a link between the memory and something else, it's extremely easy to do so – one just needs to link to the corresponding key neuron. Or, rather, one of the corresponding key neurons: depending on how many key neurons are allocated, one might end up with a number of key neurons corresponding to each memory, not just one.

In order to transform a palimpsest Hopfield net into a glocal Hopfield net, the following steps are taken:

1. Add a fixed number of "key neurons" to the network (removing other random neurons to keep the total number of neurons constant)
2. When the network reaches an attractor, create links from the elements in the attractor to one of the key neurons
3. The key neuron chosen for the previous step is the one that most closely matches the current attractor (which may be determined in several ways, to be discussed below)
4. To avoid the increase of the number of links in the network, when new links are created in Step 2, other key-neuron links are then deleted (several approaches may be taken here, but the simplest is to remove the key-neuron links with the lowest-absolute-value weights)

In the simple implementation of the above steps that we implemented, and described in [GPI+10], Step 3 is carried out simply by comparing the weights of a key neuron's links to the nodes in an attractor. A more sophisticated approach would be to select the key neuron with the highest activation during the transient interval immediately prior to convergence to the attractor.

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The result of these modifications to the ordinary Hopfield net, is a Hopfield net that continually maintains a set of key neurons, each of which individually represents a certain attractor of the net.

Note that these key neurons – in spite of being "symbolic" in nature – are learned rather than preprogrammed, and are every bit as adaptive as the attractors they correspond to. Furthermore, if a key neuron is removed, the glocal Hopfield net algorithm will eventually learn it back, so the robustness properties of Hopfield nets are retained.

The results of experimenting with glocal Hopfield nets of this nature are summarized in [GPI+10]. We studied Hopfield nets with connectivity around .1, and in this context we found that glocality

- slightly increased memory capacity
- massively increased the rate of convergence to the attractor, i.e. the speed of recall

However, probably the most important consequence of glocality is a more qualitative one: it makes it far easier to link the Hopfield net into a larger system, as would occur if the Hopfield net were embedded in an integrative AGI architecture. Because a neuron external to the Hopfield net may now link to a memory in the Hopfield net by linking to the corresponding key neuron.

13.6.4 Neural-Symbolic Glocality in CogPrime

In CogPrime, we have explicitly sought to span the symbolic/emergentist pseudo-dichotomy, via creating an integrative knowledge representation that combines logic-based aspects with neural-net-like aspects. As reviewed in Chapter 6 above, these function not in the manner of multimodular systems, but rather via using (probabilistic) truth values and (attractor neural net like) attention values as weights on nodes and links of the same (hyper) graph. The nodes and links in this hypergraph are typed, like a standard semantic network approach for knowledge representation, so they're able to handle all sorts of knowledge, from the most concrete perception and actuation related knowledge to the most abstract relationships. But they're also weighted with values similar to neural net weights, and pass around quantities (importance values, discussed in Chapter 23 of Part 2) similar to neural net activations, allowing emergent attractor/assembly based knowledge representation similar to attractor neural nets.

The concept of glocality lies at the heart of this combination, in a way that spans the pseudo-dichotomy:

- Local knowledge is represented in abstract logical relationships stored in explicit logical form, and also in Hebbian-type associations between nodes and links.
- Global knowledge is represented in large-scale patterns of node and link weights, which lead to large-scale patterns of network activity, which often take the form of attractors qualitatively similar to Hopfield net attractors. These attractors are called *maps*.

The result of all this is that a concept like "cat" might be represented as a combination of:

- A small number of logical relationships and strong associations, that constitute the "key" subnetwork for the "cat" concept.
- A large network of weak associations, binding together various nodes and links of various types and various levels of abstraction, representing the "cat map".

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The activation of the key will generally cause the activation of the map, and the activation of a significant percentage of the map will cause the activation of the rest of the map, including the key. Furthermore, if the key were for some reason forgotten, then after a significant amount of effort, the system would likely to be able to reconstitute it (perhaps with various small changes) from the information in the map. We conjecture that this particular kind of glocal memory will turn out to be very powerful for AGI, due to its ability to combine the strengths of formal logical inference with those of self-organizing attractor neural networks.

As a simple example, consider the representation of a "tower", in the context of an artificial agent that has built towers of blocks, and seen pictures of many other kinds of towers, and seen some tall building that it knows are somewhat like towers but perhaps not exactly towers. If this agent is reasonably conceptually advanced (say, at Piagetan the concrete operational level) then its mind will contain some declarative relationships partially characterizing the concept of "tower," as well as its sensory and episodic examples, and its procedural knowledge about how to build towers.

The key of the "tower" concept in the agent's mind may consist of internal images and episodes regarding the towers it knows best, the essential operations it knows are useful for building towers (piling blocks atop blocks atop blocks...), and the core declarative relations summarizing "towerness" – and the whole "tower" map then consists of a much larger number of images, episodes, procedures and declarative relationships connected to "tower" and other related entities. If any portion of the map is removed – even if the key is removed – then the rest of the map can be approximately reconstituted, after some work. Some cognitive operations are best done on the localized representation – e.g. logical reasoning. Other operations, such as attention allocation and guidance of inference control, are best done using the globalized map representation.

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Chapter 14
Representing Implicit Knowledge via Hypergraphs

14.1 Introduction

Explicit knowledge is easy to write about and talk about; implicit knowledge is equally important, but tends to get less attention in discussions of AI and psychology, simply because we don't have as good a vocabulary for describing it, nor as good a collection of methods for measuring it. One way to deal with this problem is to describe implicit knowledge using language and methods typically reserved for explicit knowledge. This might seem intrinsically non-workable, but we argue that it actually makes a lot of sense. The same sort of networks that a system like CogPrime uses to represent knowledge explicitly, can also be used to represent the *emergent* knowledge that implicitly exists in an intelligent system's complex structures and dynamics.

We've noted that CogPrime uses an explicit representation of knowledge in terms of weighted labeled hypergraphs; and also uses other more neural net like mechanisms (e.g. the economic attention allocation network subsystem) to represent knowledge globally and implicitly. CogPrime combines these two sorts of representation according to the principle we have called *glocality*. In this chapter we pursue glocality a bit further – describing a means by which even implicitly represented knowledge can be modeled using weighted labeled hypergraphs similar to the ones used explicitly in CogPrime. This is conceptually important, in terms of making clear the fundamental similarities and differences between implicit and explicit knowledge representation; and it is also pragmatically meaningful due to its relevance to the CogPrime methods described in Chapter 42 of Part 2 that transform implicit into explicit knowledge.

To avoid confusion with CogPrime's explicit knowledge representation, we will refer to the hypergraphs in this chapter as composed of Vertices and Edges rather than Nodes and Links. In prior publications we have referred to "derived" or "emergent" hypergraphs of the sort described here using the acronym **SMEPH**, which stands for Self-Modifying, Evolving Probabilistic Hypergraphs.

14.2 Key Vertex and Edge Types

We begin by introducing a particular collection of Vertex and Edge types, to be used in modeling the internal structures of intelligent systems.

The key SMEPH Vertex types are

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- ConceptVertex, representing a set, for instance, an idea or a set of percepts
- SchemaVertex, representing a procedure for doing something (perhaps something in the physical world, or perhaps an abstract mental action).

The key SMEPH Edge types, using language drawn from Probabilistic Logic Networks (PLN) and elaborated in Chapter 34 below, are as follows:

- ExtensionalInheritanceEdge (ExtInhEdge for short: an edge which, linking one Vertex or Edge to another, indicates that the former is a special case of the latter)
- ExtensionalSimilarityEdge (ExtSim: which indicates that one Vertex or Edge is similar to another)
- ExecutionEdge (a ternary edge, which joins S,B,C when S is a SchemaVertex and the result from applying S to B is C).

So, in a SMEPH system, one is often looking at hypergraphs whose Vertices represent ideas or procedures, and whose Edges represent relationships of specialization, similarity or transformation among ideas and/or procedures.

The semantics of the SMEPH edge types is given by PLN, but is simple and commonsensical. ExtInh and ExtSim Edges come with probabilistic weights indicating the extent of the relationship they denote (e.g. the ExtSimEdge joining the cat ConceptVertex to the dog ConceptVertex gets a higher probability weight than the one joining the cat ConceptVertex to the washing-machine ConceptVertex). The mathematics of transformations involving these probabilistic weights becomes quite involved - particularly when one introduces SchemaVertices corresponding to abstract mathematical operations, a step that enables SMEPH hypergraphs to have the complete mathematical power of standard logical formalisms like predicate calculus, but with the added advantage of a natural representation of uncertainty in terms of probabilities, as well as a natural representation of networks and webs of complex knowledge.

14.3 Derived Hypergraphs

We now describe how SMEPH hypergraphs may be used to model and describe intelligent systems. One can (in principle) draw a SMEPH hypergraph corresponding to any individual intelligent system, with Vertices and Edges for the concepts and processes in that system's mind. This is called the derived hypergraph of that system.

14.3.1 SMEPH Vertices

A ConceptVertex in the derived hypergraph of a system corresponds to a structural pattern that persists over time in that system; whereas a SchemaVertex corresponds to a multi-time-point dynamical pattern that recurs in that system's dynamics. If one accepts the patternist definition of a mind as the set of patterns in an intelligent system, then it follows that the derived hypergraph of an intelligent system captures a significant fraction of the mind of that system.

To phrase it a little differently, we may say that a ConceptVertex, in SMEPH, refers to the habitual pattern of activity observed in a system when some condition is met (this condition

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corresponding to the presence of a certain pattern). The condition may refer to something in the world external to the system, or to something internal. For instance, the condition may be observing a cat. In this case, the corresponding Concept vertex in the mind of Ben Goertzel is the pattern of activity observed in Ben Goertzel's brain when his eyes are open and he's looking in the direction of a cat. The notion of pattern of activity can be made rigorous using mathematical pattern theory, as is described in The Hidden Pattern [Goe06a].

Note that logical predicates, on the SMEPH level, appear as particular kinds of Concepts, where the condition involves a predicate and an argument. For instance, suppose one wants to know what happens inside Ben's mind when he eats cheese. Then there is a Concept corresponding to the condition of cheese-eating activity. But there may also be a Concept corresponding to eating activity in general. If the Concept denoting the activity of eating X is generally easily computable from the Concepts for X and eating individually, then the eating Concept is effectively acting as a predicate.

A SMEPH SchemaVertex, on the other hand, is like a Concept that's defined in a time-dependent way. One type of Schema refers to a habitual dynamical pattern of activity occurring before and/or during some condition is met. For instance, the condition might be saying the word Hello. In that case the corresponding SchemaVertex in the mind of Ben Goertzel is the pattern of activity that generally occurs before he says Hello.

Another type of Schema refers to a habitual dynamical pattern of activity occurring after some condition X is met. For instance, in the case of the Schema for adding two numbers, the precondition X consists of the two numbers and the concept of addition. The Schema is then what happens when the mind thinks of adding and thinks of two numbers.

Finally, there are Schema that refer to habitual dynamical activity patterns occurring after some condition X is met and before some condition Y is met. In this case the Schema is viewed as transforming X into Y. For instance, if X is the condition of meeting someone who is not a friend, and Y is the condition of being friends with that person, then the habitually intervening activities constitute the Schema for making friends.

14.3.2 SMEPH Edges

SMEPH edge types fall into two categories: functional and logical. Functional edges connect Schema vertices to their input and outputs; logical edges refer mainly to conditional probabilities, and in general are to be interpreted according to the semantics of Probabilistic Logic Networks.

Let us begin with logical edges. The simplest case is the Subset edge, which denotes a straightforward, extensional conditional probability. For instance, it may happen that whenever the Concept for cat is present in a system, the Concept for animal is as well. Then we would say

```
Subset cat animal
```

(Here we assume a notation where "R A B" denotes an Edge of type R between Vertices A and B.)

On the other hand, it may be that 50% of the time that cat is present in the system, cute is present as well: then we would say

```
Subset cat cute <.5>
```

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where the <.5> denotes the probability, which is a component of the Truth Value associated with the edge.

Next, the most basic functional edge is the Execution edge, which is ternary and denotes a relation between a Schema, its input and its output, e.g.

```
Execution father_of Ben_Goertzel Ted_Goertzel
```

for a schema father_of that outputs the father of its argument.

The ExecutionOutput (ExOut) edge denotes the output of a Schema in an implicit way, e.g.

```
ExOut say_hello
```

refers to a particular act of saying hello, whereas

```
ExOut add_numbers {3, 4)
```

refers to the Concept corresponding to 7. Note that this latter example involves a set of three entities: sets are also part of the basic SMEPH knowledge representation. A set may be thought of as a hypergraph edge that points to all its members.

In this manner we may define a set of edges and vertices modeling the habitual activity patterns of a system when in different situations. This is called the derived hypergraph of the system. Note that this hypergraph can in principle be constructed no matter what happens inside the system: whether it's a human brain, a formal neural network, Cyc, OCP, a quantum computer, etc. Of course, constructing the hypergraph in practice is quite a different story: for instance, we currently have no accurate way of measuring the habitual activity patterns inside the human brain. fMRI and PET and other neuroimaging technologies give only a crude view, though they are continually improving.

Pattern theory enters more deeply here when one thoroughly fleshes out the Inheritance concept. Philosophers of logic have extensively debated the relationship between extensional inheritance (inheritance between sets based on their members) and intensional inheritance (inheritance between entity-types based on their properties). A variety of formal mechanisms have been proposed to capture this conceptual distinction; see (Wang, 2006, 1995 TODO make ref) for a review along with a novel approach utilizing uncertain term logic. Pattern theory provides a novel approach to defining intension: one may associate with each ConceptVertex in a system's derived hypergraph the set of patterns associated with the structural pattern underlying that ConceptVertex. Then, one can define the strength of the IntensionalInheritanceEdge between two ConceptVertices A and B as the percentage of A's pattern-set that is also contained in B's pattern-set. According to this approach, for instance, one could have

```
IntInhEdge whale fish <0.6>

ExtInhEdge whale fish <0.0>
```

since the fish and whale sets have common properties but no common members.

14.4 Implications of Patternist Philosophy for Derived Hypergraphs of Intelligent Systems

Patternist philosophy rears its head here and makes some definite hypotheses about the structure of derived hypergraphs. It suggests that derived hypergraphs should have a dual network

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structure, and that in highly intelligent systems they should have subgraphs that constitute models of the whole hypergraph (these are self systems). SMEPH does not add anything to the patternist view on a philosophical level, but it gives a concrete instantiation to some of the general ideas of patternism. In this section we'll articulate some "SMEPH principles", constituting important ideas from patternist philosophy as they manifest themselves in the SMEPH context.

The logical edges in a SMEPH hypergraph are weighted with probabilities, as in the simple example given above. The functional edges may be probabilistically weighted as well, since some Schema may give certain results only some of the time. These probabilities are critical in terms of SMEPH's model of system dynamics; they underly one of our SMEPH principles,

Principle of Implicit Probabilistic Inference: In an intelligent system, the temporal evolution of the probabilities on the edges in the system's derived hypergraph should approximately obey the rules of probability theory.

The basic idea is that, even if a system - through its underlying dynamics - has no explicit connection to probability theory, it still must behave roughly as if it does, if it is going to be intelligent. The roughly part is important here; it's well known that humans are not terribly accurate in explicitly carrying out formal probabilistic inferences. And yet, in practical contexts where they have experience, humans can make quite accurate judgments; which is all that's required by the above principle, since it's the contexts where experience has occurred that will make up a system's derived hypergraph.

Our next SMEPH principle is evolutionary, and states

Principle of Implicit Evolution: In an intelligent system, new Schema and Concepts will continually be created, and the Schema and Concepts that are more useful for achieving system goals (as demonstrated via probabilistic implication of goal achievement) will tend to survive longer.

Note that this principle can be fulfilled in many different ways. The important thing is that system goals are allowed to serve as a selective force.

Another SMEPH dynamical principle pertains to a shorter time-scale than evolution, and states

Principle of Attention Allocation: In an intelligent system, Schema and Concepts that are more useful for attaining short-term goals will tend to consume more of the system's energy. (The balance of attention oriented toward goals pertaining to different time scales will vary from system to system.)

Next, there is the

Principle of Autopoesis: In an intelligent system, if one removes some part of the system and then allows the system's natural dynamics to keep going, a decent approximation to that removed part will often be spontaneously reconstituted.

And there is the

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Cognitive Equation Principle: In an intelligent system, many abstract patterns that are present in the system at a certain time as patterns among other Schema and Concepts, will at a near-future time be present in the system as patterns among elementary system components.

The Cognitive Equation Principle, briefly discussed in Chapter 3, basically means that Concepts and Schema emergent in the system are recognized by the system and then embodied as elementary items in the system so that patterns among them in their emergent form become, with the passage of time, patterns among them in their directly-system-embodied form. This is a natural consequence of the way intelligent systems continually recognize patterns in themselves.

Note that derived hypergraphs may be constructed corresponding to any complex system which demonstrates a variety of internal dynamical patterns depending on its situation. However, if a system is not intelligent, then according to the patternist philosophy evolution of its derived hypergraph can't necessarily be expected to follow the above principles.

14.4.1 SMEPH Principles in CogPrime

We now more explicitly elaborate the application of these ideas in the CogPrime context. As noted above, in addition to explicit knowledge representation in terms of Nodes and Links, CogPrime also incorporates implicit knowledge representation in the form of what are called Maps: collections of Nodes and Links that tend to be utilized together within cognitive processes.

These Maps constitute a CogPrime system's derived hypergraph, which will not be identical to the hypergraph it uses for explicit knowledge representation. However, an interesting feedback loop arises here, in that the intelligence's self-study will generally lead it to recognize large portions of its derived hypergraph as patterns in itself, and then embody these patterns within its concretely implemented knowledge hypergraph. This relates to the Cognitive Equation Principle defined above 3, in which an intelligent system continually recognizes patterns in itself and embodies these patterns in its own basic structure (so that new patterns may more easily emerge from them).

Often it happens that a particular CogPrime node will serve as the center of a map, so that e.g. the Concept Link denoting cat will consist of a number of nodes and links roughly centered around a ConceptNode that is linked to the WordNode cat. But this is not guaranteed and some CogPrime maps are more diffuse than this with no particular center.

Somewhat similarly, the key SMEPH dynamics are represented explicitly in CogPrime: probabilistic reasoning is carried out via explicit application of PLN on the CogPrime hypergraph, evolutionary learning is carried out via application of the MOSES optimization algorithm, and attention allocation is carried out via a combination of inference and evolutionary pattern mining. But the SMEPH dynamics also occur implicitly in CogPrime: emergent maps are reasoned on probabilistically as an indirect consequence of node-and-link level PLN activity; maps evolve as a consequence of the coordinated whole of CogPrime dynamics; and attention shifts between maps according to complex emergent dynamics.

To see the need for maps, consider that even a Node that has a particular meaning attached to it - like the *Iraq* Node, say - doesn't contain much of the meaning of *Iraq* in it. The meaning of *Iraq* lies in the Links attached to this Node, and the Links attached to their Nodes - and the other Nodes and Links not explicitly represented in the system, which will be created by

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CogPrime's cognitive algorithms based on the explicitly existent Nodes and Links related to the *Iraq* Node.

This halo of Atoms related to the *Iraq* node is called the *Iraq* map. In general, some maps will center around a particular Atom, like this *Iraq* map, others may not have any particular identifiable center. CogPrime's cognitive processes act directly on the level of Nodes and Links, but they must be analyzed in terms of their impact on maps as well. In SMEPH terms, CogPrime maps may be said to correspond to SMEPH ConceptNodes, and for instance bundles of Links between the Nodes belonging to a map may correspond to a SMEPH Link between two ConceptNodes.

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Chapter 15
Emergent Networks of Intelligence

15.1 Introduction

When one is involved with engineering an AGI system, one thinks a lot about the aspects of the system one is explicitly building – what are the parts, how they fit together, how to test they're properly working, and so forth. And yet, these explicitly engineered aspects are only a fraction of what's important in an AGI system. At least as critical are the *emergent* aspects – the patterns that emerge once the system is up and running, interacting with the world and other agents, growing and developing and learning and self-modifying. SMEPH is one toolkit for describing some of these emergent patterns, but it's only a start.

In line with these general observations, most of this book will focus on the structures and processes that we have built, or intend to build, into the CogPrime system. But in a sense, these structures and processes are not the crux of CogPrime's intended intelligence. The purpose of these pre-programmed structures and processes is to give rise to *emergent* structures and processes, in the course of CogPrime's interaction with the world and the other minds within it. We will return to this theme of emergence at several points in later chapters, e.g. in the discussion of map formation in Chapter 42 of Part 2.

Given the important of emergent structures – and specifically emergent *network* structures – for intelligence, it's fortunate the scientific community has already generated a lot of knowledge about complex networks: both networks of physical or software elements, and networks of organization emergent from complex systems. As most of this knowledge has originated in fields other than AGI, or in pure mathematics, it tends to require some reinterpretation or tweaking to achieve maximal applicability in the AGI context; but we believe this effort will become increasingly worthwhile as the AGI field progresses, because network theory is likely to be very useful for describing the contents and interactions of AGI systems as they develop increasing intelligence.

In this brief chapter we specifically focus on the emergence of certain large-scale *network structures* in a CogPrime knowledge store, presenting heuristic arguments as to why these structures can be expected to arise. We also comment on the way in which these emergent structures are expected to guide cognitive processes, and give rise to emergent cognitive processes. The following chapter expands on this theme in a particular direction, exploring the possible emergence of structures characterizing inter-cognitive reflection.

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15.2 Small World Networks

One simple but potentially useful observation about CogPrime Atomspaces is that they are generally going to be *small world networks* [Buc03], rather than random graphs. A small world network is a graph in which the connectivities of the various nodes display a power law behavior – so that, loosely speaking, there are a few nodes with very many links, then more nodes with a modest number of links ... and finally, a huge number of nodes with very few links. This kind of network occurs in many natural and human systems, including citations among papers, financial arrangements among banks, links between Web pages and the spread of diseases among people or animals. In a weighted network like an Atomspace, "small-world-ness" must be defined in a manner taking the weights into account, and there are several obvious ways to do this. Figure 15.1 depicts a small but prototypical small-worlds network, with a few "hub" nodes possessing far more neighbors than the others, and then some secondary hubs, etc.

An excellent reference on network theory in general, including but not limited to small world networks, is Peter Csermely's *Weak Links* [Cse06]. Many of the ideas in that work have apparent OpenCog applications, which are not elaborated here.

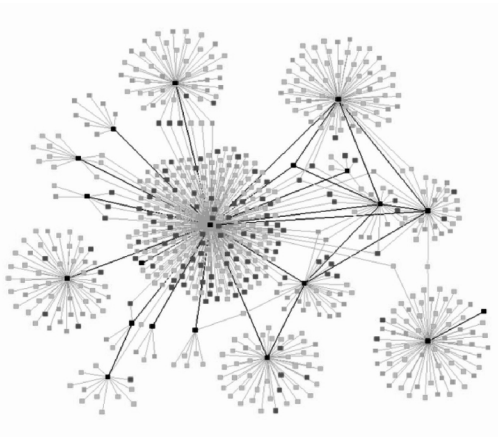

Fig. 15.1: A typical, though small-sized, small-worlds network.

One process via which small world networks commonly form is "preferential attachment" [Bar02]. This occurs in essence when "the rich get richer" – i.e. when nodes in the network grow new links, in a manner that causes them to preferentially grow links to nodes that already have more links. It is not hard to see that CogPrime's ECAN dynamics will naturally lead to

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preferential attachment, because Atoms with more links will tend to get more STI, and thus will tend to get selected by more cognitive processes, which will cause them to grow more links. For this reason, in most circumstances, a CogPrime system in which most link-building cognitive processes rely heavily on ECAN to guide their activities will tend to contain a small-world-network Atomspace. This is not rigorously guaranteed to be the case for any possible combination of environment and goals, but it is commonsensically likely to nearly always be the case.

One consequence of the small worlds structure of the Atomspace is that, in exploring other properties of the Atom network, it is particularly important to look at the hub nodes. For instance, if one is studying whether hierarchical and heterarchical subnetworks of the Atomspace exist, and whether they are well-aligned with each other, it is important to look at hierarchical and heterarchical connections between hub nodes in particular (and secondary hubs, etc.). A pattern of hierarchical or dual network connection that only held up among the more sparsely connected nodes in a small-world network would be a strange thing, and perhaps not that cognitively useful.

15.3 Dual Network Structure

One of the key theoretical notions in patternist philosophy is that complex cognitive systems evolve internal *dual network* structures, comprising superposed, harmonized hierarchical and heterarchical networks. Now we explore some of the specific CogPrime structures and dynamics militating in favor of the emergence of dual networks.

15.3.1 Hierarchical Networks

The hierarchical nature of human linguistic concepts is well known, and is illustrated in Figure 15.2 for the commonsense knowledge domain (using a graph drawn from WordNet, a huge concept hierarchy covering 50K+ English-language concepts), and in Figure 15.4 for a specialized knowledge subdomain, genetics. Due to this fact, a certain amount of hierarchy can be expected to emerge in the Atomspace of any linguistically savvy CogPrime, simply due to its modeling of the linguistic concepts that it hears and reads.

Hierarchy also exists in the natural world apart from language, which is the reason that many sensorimotor-knowledge-focused AGI systems (e.g. DeSTIN and HTM, mentioned in Chapter 4 above) feature hierarchical structures. In these cases the hierarchies are normally spatiotemporal in nature - with lower layers containing elements responding to more localized aspects of the perceptual field, and smaller, more localized groups of actuators. This kind of hierarchy certainly *could* emerge in an AGI system, but in CogPrime we have opted for a different route. If a CogPrime system is hybridized with a hierarchical sensorimotor network like one of those mentioned above, then the Atoms linked to the nodes in the hierarchical sensorimotor network will naturally possess hierarchical conceptual relationships, and will thus naturally grow hierarchical links between them (e.g. InheritanceLinks and IntensionalInheritanceLinks via PLN, AsymmetricHebbianLinks via ECAN).

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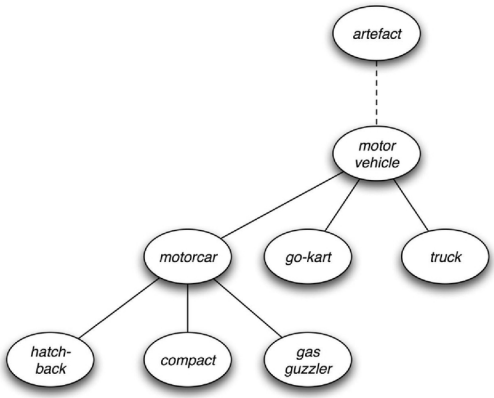

Fig. 15.2: A typical, though small, subnetwork of WordNet's hierarchical network.

Once elements of hierarchical structure exist via the hierarchical structure of language and physical reality, then a richer and broader hierarchy can be expected to accumulate on top of it, because importance spreading and inference control will implicitly and automatically be guided by the existing hierarchy. That is, in the language of *Chaotic Logic* [Goe94] and patternist theory, hierarchical structure is an "autopoietic attractor" – once it's there it will tend to enrich itself and maintain itself. AsymmetricHebbianLinks arranged in a hierarchy will tend to cause importance to spread up or down the hierarchy, which will lead other cognitive processes to look for patterns between Atoms and their hierarchical parents or children, thus potentially building more hierarchical links. Chains of InheritanceLinks pointing up and down the hierarchy will lead PLN to search for more hierarchical links – e.g. most simply, $A \to B \to C$ where C is above B is above A in the hierarchy, will naturally lead inference to check the viability of $A \to C$ by deduction. There is also the possibility to introduce a special DefaultInheritanceLink, as discussed in Chapter 34 of Part 2, but this isn't actually necessary to obtain the inferential maintenance of a robust hierarchical network.

15.3.2 Associative, Heterarchical Networks

Heterarchy is in essence a simpler structure than hierarchy: it simply refers to a network in which nodes are linked to other nodes with which they share important relationships. That is, there should be a tendency that if two nodes are often important in the same contexts or for

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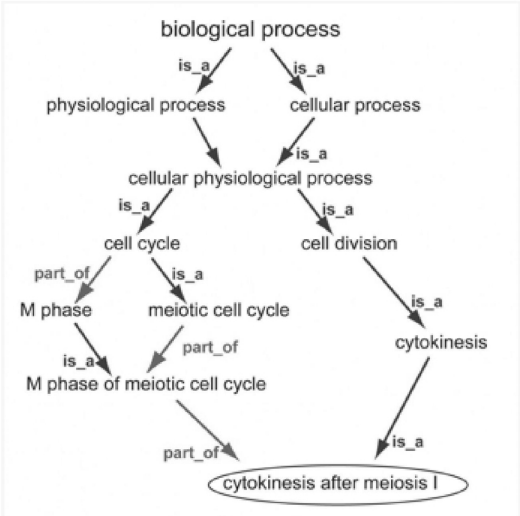

Fig. 15.3: A typical, though small, subnetwork of the Gene Ontology's hierarchical network.

the same purposes, they should be linked together. Portrayals of typical heterarchical linkage patterns among natural language concepts are given in Figures 15.5 and 15.6. Just for fun, Figure 15.7 shows one person's attempt to draw a heterarchical graph of the main concepts in one of Douglas Hofstadter's books. Naturally, real concept heterarchies are far more large, complex and tangled than even this one.

In CogPrime, ECAN enforces heterarchy via building SymmetricHebbianLinks, and PLN by building SimilarityLinks, IntensionalSimilarityLinks and ExtensionalSimilarityLinks. Furthermore, these various link types reinforce each other. PLN control is guided by importance spreading, which follows Hebbian links, so that a heterarchical Hebbian network tends to cause PLN to explore the formation of links following the same paths as the heterarchical Hebbian-Links. And importance can spread along logical links as well as explicit Hebbian links, so that the existence of a heterarchical logical network will tend to cause the formation of additional heterarchical Hebbian links. Heterarchy reinforces itself in "autopoietic attractor" style even more simply and directly than heterarchy.

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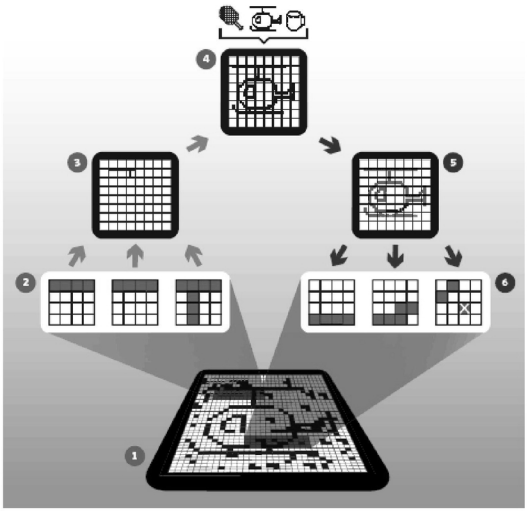

Fig. 15.4: Small-scale portrayal of a portion of the spatiotemporal hierarchy in Jeff Hawkins' Hierarchical Temporal Memory architecture.

15.3.3 Dual Networks

Finally, if both hierarchical and heterarchical structures exist in an Atomspace, then both ECAN and PLN will naturally blend them together, because hierarchical and heterarchical links will feed into their link-creation processes and naturally be combined together to form new links. This will tend to produce a structure called a *dual network*, in which a hierarchy exists, along with a rich network of heterarchical links joining nodes in the hierarchy, with a particular density of links between nodes on the same hierarchical level. The dual network structure will emerge without any explicit engineering oriented toward it, simply via the existence of hierarchical and heterarchical networks, and the propensity of ECAN and PLN to be guided by both the hierarchical and heterarchical networks. The existence of a natural dual network structure in both linguistic and sensorimotor data will help the formation process along, and then creative cognition will enrich the dual network yet further than is directly necessitated by the external world.

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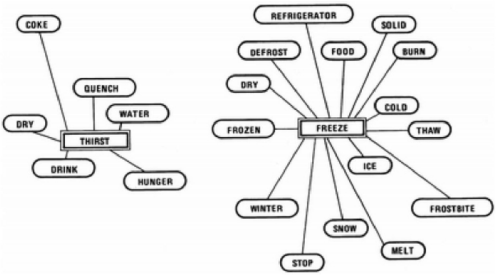

Fig. 15.5: Portions of a conceptual heterarchy centered on specific concepts.

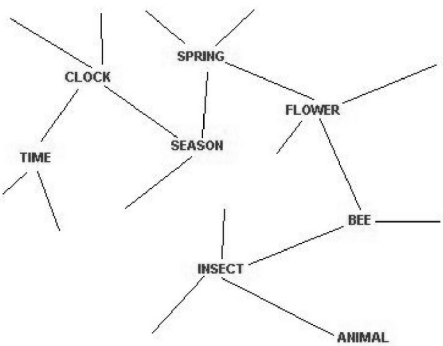

Fig. 15.6: A portion of a conceptual heterarchy, showing the "dangling links" leading this portion to the rest of the heterarchy.

A rigorous mathematical analysis of the formation of hierarchical, heterarchical and dual networks in CogPrime systems has not yet been undertaken, and would certainly be an interesting enterprise. Similar to the theory of small world networks, there is ample ground here for both theorem-proving and heuristic experimentation. However, the qualitative points made here are sufficiently well-grounded in intuition and experience to be of some use guiding our

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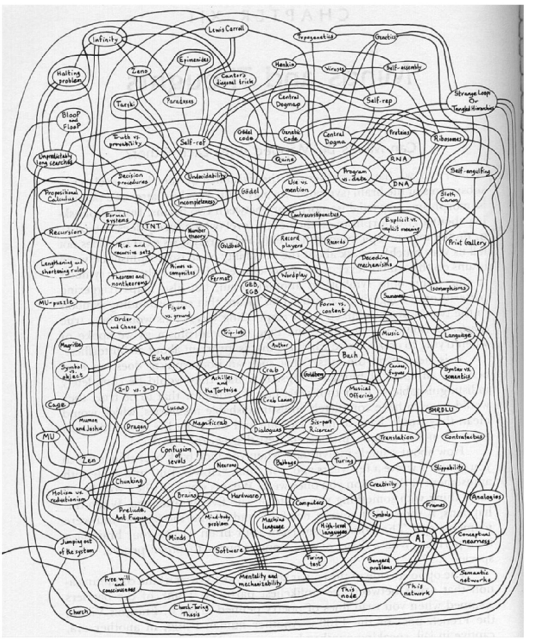

Fig. 15.7: A fanciful evocation of part of a reader's conceptual heterarchy related to Douglas Hofstadter's writings.

ongoing work. One of the nice things about emergent network structures is that they are relatively straightforward to observe in an evolving, learning AGI system, via visualization and inspection of structures such at the Atomspace.

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Section V
A Path to Human-Level AGI

Chapter 16
AGI Preschool

Co-authored with Stephan Vladimir Bugaj

16.1 Introduction

In conversations with government funding sources or narrow AI researchers about AGI work, one of the topics that comes up most often is that of "evaluation and metrics" – i.e., AGI intelligence testing. We actually prefer to separate this into two topics: environments and methods for careful qualitative evaluation of AGI systems, versus metrics for precise measurement of AGI systems. The difficulty of formulating bulletproof metrics for partial progress toward advanced AGI has become evident throughout the field, and in Chapter 8 we have elaborated one plausible explanation for this phenomenon, the "trickiness" of cognitive synergy. [LWML09], summarizing a workshop on "Evaluation and Metrics for Human-Level AI" held in 2008, discusses some of the general difficulties involved in this type of assessment, and some requirements that any viable approach must fulfill. On the other hand, the lack of appropriate methods for careful qualitative evaluation of AGI systems has been much less discussed, but we consider it actually a more important issue – as well as an easier (though not easy) one to solve.

We haven't actually found the lack of quantitative intelligence metrics to be a major obstacle in our practical AGI work so far. Our OpenCogPrime implementation lags far behind the CogPrime design as articulated in Part 2 of this book, and according to the theory underlying CogPrime, the more interesting behaviors and dynamics of the system will occur only when all the parts of the system have been engineered to a reasonable level of completion and integrated together. So, the lack of a great set of metrics for evaluating the intelligence of our partially-built system hasn't impaired too much. Testing the intelligence of the current OpenCogPrime system is a bit like testing the flight capability of a partly-built airplane that only has stubs for wings, lacks tail-fins, has a much less efficient engine than the one that's been designed for use in the first "real" version of the airplane, etc. There may be something to be learned from such preliminary tests, but making them highly rigorous isn't a great use of effort, compared to working on finishing implementing the design according to the underlying theory.

On the other hand, the problem of what environments and methods to use to qualitatively evaluate and study AGI progress, has been considerably more vexing to us in practice, as we've proceeded in our work on implementing and testing OpenCogPrime and developing the CogPrime theory. When developing a complex system, it's nearly always valuable to see what this system does in some fairly rich, complex situations, in order to gain a better intuitive understanding of the parts and how they work together. In the context of human-level AGI, the theoretically best way to do this would be to embody one's AGI system in a humanlike body

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and set it loose in the everyday human world; but of course, this isn't feasible given the current state of development of robotics technology. So one must seek approximations. Toward this end we have embodied OpenCogPrime in non-player characters in video game style virtual worlds, and carried out preliminary experiments embodying OpenCogPrime in humanoid robots. These are reasonably good options but they have limitations and lead to subtle choices: what kind of game characters and game worlds, what kind of robot environments, etc.?

One conclusion we have come to, based largely on the considerations in Chapter 11 on development and Chapter 9 on the importance of environment, is that it may make sense to embed early-stage proto-AGI and AGI systems in environments reminiscent of those used for teaching young human children. In this chapter we will explore this approach in some detail: emulation, in either physical reality or an multiuser online virtual world, of an environment similar to preschools used in early human childhood education. Complete specification of an "AGI Preschool" would require much more than a brief chapter; our goal here is to sketch the idea in broad outline, and give a few examples of the types of opportunities such an environment would afford for instruction, spontaneous learning and formal and informal evaluation of certain sorts of early-stage AGI systems.

The material in this chapter will pop up fairly often later in the book. The AGI Preschool context will serve, throughout the following chapters, as a source of concrete examples of the various algorithms and structures. But it's not proposed merely as an expository tool; we are making the very serious proposal that sending AGI systems to a virtual or robotic preschool is an excellent way – perhaps the best way – to foster the development of human-level human-like AGI.

16.1.1 Contrast to Standard AI Evaluation Methodologies

The reader steeped in the current AI literature may wonder why it's necessary to introduce a new methodology and environment for evaluating AGI systems. There are already very many different ways of evaluating AI systems out there ... do we really need another?

Certainly, the AI field has inspired many competitions, each of which tests some particular type or aspect of intelligent behavior. Examples include robot competitions, tournaments of computer chess, poker, backgammon and so forth at computer olympiads, trading-agent competition, language and reasoning competitions like the Pascal Textual Entailment Challenge, and so on. In addition to these, there are many standard domains and problems used in the AI literature that are meant to capture the essential difficulties in a certain class of learning problems: standard datasets for face recognition, text parsing, supervised classification, theorem-proving, question-answering and so forth.

However, the value of these sorts of tests for AGI is predicated on the hypothesis that the degree of success of an AI program at carrying out some domain-specific task, is correlated with the potential of that program for being developed into a robust AGI program with broad intelligence. If humanlike AGI and problem-area-specific "narrow AI" are in fact very different sorts of pursuits requiring very different principles, as we suspect, then these tests are not strongly relevant to the AGI problem.

There are also some standard evaluation paradigms aimed at AI going beyond specific tasks. For instance, there is a literature on "multitask learning" and "transfer learning," where the goal for an AI is to learn one task quicker given another task solved previously [Car97, TM95,

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BDS03, TS07, RZDK05]. This is one of the capabilities an AI agent will need to simultaneously learn different types of tasks as proposed in the Preschool scenario given here. And there is a literature on "shaping," where the idea is to build up the capability of an AI by training it on progressively more difficult versions of the same tasks [LD03]. Again, this is one sort of capability an AI will need to possess if it is to move up some type of curriculum, such as a school curriculum.

While we applaud the work done on multitask learning and shaping, we feel that exploring these processes using mathematical abstractions, or in the domain of various narrowly-proscribed machine-learning or robotics test problems, may not adequately address the problem of AGI. The problem is that generalization among tasks, or from simpler to more difficult versions of the same task, is a process whose nature may depend strongly on the overall nature of the set of tasks and task-versions involved. Real-world tasks have a subtlety of interconnectedness and developmental course that is not captured in current mathematical learning frameworks nor standard AI test problems.

To put it mathematically, we suggest that the universe of real-world human tasks has a host of "special statistical properties" that have implications regarding what sorts of AI programs will be most suitable; and that, while exploring and formalizing the nature of these statistical properties is important, an easier and more reliable approach to AGI testing is to create a testing environment that embodies these properties implicitly, via its being an emulation of the cognitively meaningful aspects of the real-world human learning environment.

One way to see this point vividly is to contrast the current proposal with the "General Game Player" AI competition, in which AIs seek to learn to play games based on formal descriptions of the rules.[1]. Clearly doing GGP well requires powerful AGI; and doing GGP even mediocrely probably requires robust multitask learning and shaping. But we suspect GGP is far inferior to AGI Preschool as an approach to testing early-stage AI programs aimed at roughly humanlike intelligence. This is because, unlike the tasks involved in AI Preschool, the tasks involved in doing simple instances of GGP seem to have little relationship to humanlike intelligence or real-world human tasks.

16.2 Elements of Preschool Design

What we mean by an "AGI Preschool" is simply a porting to the AGI domain of the essential aspects of human preschools. While there is significant variance among preschools there are also strong commonalities, grounded in educational theory and experience. We will briefly discuss both the physical design and educational curriculum of the typical human preschool, and which aspects transfer effectively to the AGI context.

On the physical side, the key notion in modern preschool design is the "learning center," an area designed and outfitted with appropriate materials for teaching a specific skill. Learning centers are designed to encourage learning by doing, which greatly facilitates learning processes based on reinforcement, imitation and correction (see Chapter 31 of Part 2 for a detailed discussion of the value of this combination); and also to provide multiple techniques for teaching the same skills, to accommodate different learning styles and prevent over-fitting and overspecialization in the learning of new skills.

[1] http://games.stanford.edu/

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Centers are also designed to cross-develop related skills. A "manipulatives center," for example, provides physical objects such as drawing implements, toys and puzzles, to facilitate development of motor manipulation, visual discrimination, and (through sequencing and classification games) basic logical reasoning. A "dramatics center," on the other hand, cross-trains interpersonal and empathetic skills along with bodily-kinesthetic, linguistic, and musical skills. Other centers, such as art, reading, writing, science and math centers are also designed to train not just one area, but to center around a primary intelligence type while also cross-developing related areas. For specific examples of the learning centers associated with particular contemporary preschools, see [Nie98].

In many progressive, student-centered preschools, students are left largely to their own devices to move from one center to another throughout the preschool room. Generally, each center will be staffed by an instructor at some points in the day but not others, providing a variety of learning experiences. At some preschools students will be strongly encouraged to distribute their time relatively evenly among the different learning centers, or to focus on those learning centers corresponding to their particular strengths and/or weaknesses.

To imitate the general character of a human preschool, one would create several centers in a robot lab or virtual world. The precise architecture will best be adapted via experience but initial centers would likely be:

- **a blocks center**: a table with blocks on it
- **a language center**: a circle of chairs, intended for people to sit around and talk with the robot
- **a manipulatives center**: with a variety of different objects of different shapes and sizes, intended to teach visual and motor skills
- **a ball play center**: where balls are kept in chests and there is space for the robot to kick the balls around
- **a dramatics center**: where the robot can observe and enact various movements

16.3 Elements of Preschool Curriculum

While preschool curricula vary considerably based on educational philosophy and regional and cultural factors, there is a great deal of common, shared wisdom regarding the most useful topics and methods for preschool teaching. Guided experiential learning in diverse environments and using varied materials is generally agreed upon as being an optimal methodology to reach a wide variety of learning types and capabilities. Hands-on learning provides grounding in specifics, where as a diversity of approaches allows for generalization.

Core knowledge domains are also relatively consistent, even across various philosophies and regions. Language, movement and coordination, autonomous judgment, social skills, work habits, temporal orientation, spatial orientation, mathematics, science, music, visual arts, and dramatics are universal areas of learning which all early childhood learning touches upon. The particulars of these skills may vary, but all human children are taught to function in these domains. The level of competency developed may vary, but general domain knowledge is provided. For example, most kids won't be the next Maria Callas, Ravi Shankar or Gene Ween, but nearly all learn to hear, understand and appreciate music.

Tables 16.1 - 16.3 review the key capabilities taught in preschools, and identify the most important specific skills that need to be evaluated in the context of each capability. This ta-

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ble was assembled via surveying the curricula from a number of currently existing preschools employing different methodologies both based on formal academic cognitive theories [Sch07] and more pragmatic approaches, such as: Montessori [Mon12], Waldorf [SS03b], Brain Gym (`www.braingym.org`) and Core Knowledge (`www.coreknowledge.org`).

Type of Capability	*Specific Skills to be Evaluated*
Story Understanding	• Understanding narrative sequence • Understanding character development • Dramatize a story • Predict what comes next in a story
Linguistic	• Give simple descriptions of events • Describe similarities and differences • Describe objects and their functions
Linguistic / Spatial-Visual	Interpreting pictures
Linguistic / Social	• Asking questions appropriately • Answering questions appropriately • Talk about own discoveries • Initiate conversations • Settle disagreements • Verbally express empathy • Ask for help • Follow directions
Linguistic / Scientific	• Provide possible explanations for events or phenomena • Carefully describe observations • Draw conclusions from observations

Table 16.1: Categories of Preschool Curriculum, Part 1

16.3.1 Preschool in the Light of Intelligence Theory

Comparing Table 16.1 to Gardner's Multiple Intelligences (MI) framework briefly reviewed in Chapter 2, the high degree of harmony is obvious, and is borne out by more detailed analysis. Preschool curriculum as standardly practiced is very well attuned to MI, and naturally covers all the bases that Gardner identifies as important. And this is not at all surprising since one of Gardner's key motivations in articulating MI theory was the pragmatics of educating humans with diverse strengths and weaknesses.

Regarding intelligence as "the ability to achieve complex goals in complex environments," it is apparent that preschools are specifically designed to pack a large variety of different micro-

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Type of Capability	*Specific Skills to be Evaluated*
Logical-Mathematical	• Categorizing • Sorting • Arithmetic • Performing simple "proto-scientific experiments"
Nonverbal Communication	• Communicating via gesture • Dramatizing situations • Dramatizing needs, wants • Express empathy
Spatial-Visual	• Visual patterning • Self-expression through drawing • Navigate
Objective	• Assembling objects • Disassembling objects • Measurement • Symmetry • Similarity between structures (e.g. block structures and real ones)

Table 16.2: Categories of Preschool Curriculum, Part 2

Type of Capability	*Specific Skills to be Evaluated*
Interpersonal	• Cooperation • Display appropriate behavior in various settings • Clean up belongings • Share supplies
Emotional	• Delay gratification • Control emotional reactions • Complete projects

Table 16.3: Categories of Preschool Curriculum, Part 3

environments (the learning centers) into a single room, and to present a variety of different tasks in each environment. The environments constituted by preschool learning centers are designed as microcosms of the most important aspects of the environments faced by humans in their everyday lives.

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16.4 Task-Based Assessment in AGI Preschool

Professional pedagogues such as [CM07] discuss evaluation of early childhood learning as intended to assess both specific curriculum content knowledge as well as the child's learning process. It should be as unobtrusive as possible, so that it just seems like another engaging activity, and the results used to tailor the teaching regimen to use different techniques to address weaknesses and reinforce strengths.

For example, with group building of a model car, students are tested on a variety of skills: procedural understanding, visual acuity, motor acuity, creative problem solving, interpersonal communications, empathy, patience, manners, and so on. With this kind of complex, yet engaging, activity as a metric the teacher can see how each student approaches the process of understanding each subtask, and subsequently guide each student's focus differently depending on strengths and weaknesses.

In Tables 16.4 and 16.5 we describe some particular tasks that AGIs may be meaningfully assigned in the context of a general AGI Preschool design and curriculum as described above. Of course, this is a very partial list, and is intended as evocative rather than comprehensive.

Any one of these tasks can be turned into a rigorous quantitative test, thus allowing the precise comparison of different AGI systems' capabilities; but we have chosen not to emphasize this point here, partly for space reasons and partly for philosophical ones. In some contexts the quantitative comparison of different systems may be the right thing to do, but as discussed in Chapter 17 there are also risks associated with this approach, including the emergence of an overly metrics-focused "bakeoff mentality" among system developers, and overfitting of AI abilities to test taking. What is most important is the isolation of specific tasks on which different systems may be experientially trained and then qualitatively assessed and compared, rather than the evaluation of quantitative metrics.

Task-oriented testing allows for feedback on applications of general pedagogical principles to real-world, embodied activities. This allows for iterative refinement based learning (shaping), and cross development of knowledge acquisition and application (multitask learning). It also helps militate against both cheating, and over-fitting, as teachers can make ad-hoc modifications to the tests to determine if this is happening and correct for it if necessary.

E.g., consider a linguistic task in which the AGI is required to formulate a set of instructions encapsulating a given behavior (which may include components that are physical, social, linguistic, etc.). Note that although this is presented as centrally a linguistic task, it actually involves a diverse set of competencies since the behavior to be described may encompass multiple real-world aspects.

To turn this task into a more thorough test one might involve a number of human teachers and a number of human students. Before the test, an ensemble of copies of the AGI would be created, with identical knowledge state. Each copy would interact with a different human teacher, who would demonstrate to it a certain behavior. After testing the AGI on its own knowledge of the material, the teacher would then inform the AGI that it will then be tested on its ability to verbally describe this behavior to another. Then, the teacher goes away and the copy interacts with a series of students, attempting to convey to the students the instructions given by the teacher.

The teacher can thereby assess both the AGI's understanding of the material, and the ability to explain it to the other students. This separates out assessment of understanding from assessment of ability to communicate understanding, attempting to avoid conflation of one with the other. The design of the training and testing needs to account for potential

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Intelligence Type	Test
Linguistic	• write a set of instructions • speak on a subject • edit a written piece or work • write a speech • commentate on an event • apply positive or negative 'spin' to astory
Logical-Mathematical	• perform arithmetic calculations • create a process to measure something • analyse how a machine works • create a process • devise a strategy to achieve an aim • assess the value of a proposition
Musical	• perform a musical piece • sing a song • review a musical work • coach someone to play a musical instrument
Bodily-Kinesthetic	• juggle • demonstrate a sports technique • flip a beer-mat • create a mime to explain something • toss a pancake • fly a kite

Table 16.4: Prototypical preschool intelligence assessment tasks, Part 1

This testing protocol abstracts away from the particularities of any one teacher or student, and focuses on effectiveness of communication in a human context rather than according to formalized criteria. This is very much in the spirit of how assessment takes place in human preschools (with the exception of the copying aspect): formal exams are rarely given in preschool, but pragmatic, socially-embedded assessments are regularly made.

By including the copying aspect, more rigorous statistical assessments can be made regarding efficacy of different approaches for a given AGI design, independent of past teaching experiences. The multiple copies may, depending on the AGI system design, then be able to be reintegrated, and further "learning" be done by higher-order cognitive systems in the AGI that integrate the disparate experiences of the multiple copies.

This kind of parallel learning is different from both sequential learning that humans do, and parallel presences of a single copy of an AGI (such as in multiple chat rooms type experiments). All three approaches are worthy of study, to determine under what circumstances, and with which AGI designs, one is more successful than another.

It is also worth observing how this test could be tweaked to yield a test of generalization ability. After passing the above, the AGI could then be given a description of a new task

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Intelligence Type	Test
Spatial-Visual	• design a costume • interpret a painting • create a room layout • create a corporate logo • design a building • pack a suitcase or the trunk of a car
Interpersonal	• interpret moods from facial expressions • demonstrate feelings through body language • affect the feelings of others in a planned way • coach or counsel another

Table 16.5: Prototypical preschool intelligence assessment tasks, Part 2

(acquisition), and asked to explain the new one (variation). And, part of the training behavior might be carried out unobserved by the AGI, thus requiring the AGI to infer the omitted parts of the task it needs to describe.

Another popular form of early childhood testing is puzzle block games. These kinds of games can be used to assess a variety of important cognitive skills, and to do so in a fun way that not only examines but also encourages creativity and flexible thinking. Types of games include pattern matching games in which students replicate patterns described visually or verbally, pattern creation games in which students create new patterns guided by visually or verbally described principles, creative interpretation of patterns in which students find meaning in the forms, and free-form creation. Such games may be individual or cooperative.

Cross training and assessment of a variety of skills occurs with pattern block games: for example, interpretation of visual or linguistic instructions, logical procedure and pattern following, categorizing, sorting, general problem solving, creative interpretation, experimentation, and kinematic acuity. By making the games cooperative, various interpersonal skills involving communication and cooperation are also added to the mix.

The puzzle block context bring up some general observations about the role of kinematic and visuospatial intelligence in the AGI Preschool. Outside of robotics and computer vision, AI research has often downplayed these sorts of intelligence (though, admittedly, this is changing in recent years, e.g. with increasing research focus on diagrammatic reasoning). But these abilities are not only necessary to navigate real (or virtual) spatial environments. They are also important components of a coherent, conceptually well-formed understanding of the world in which the student is embodied. Integrative training and assessment of both rigorous cognitive abilities generally most associated with both AI and "proper schooling" (such as linguistic and logical skills) along with kinematic and aesthetic/sensory abilities is essential to the development of an intelligence that can successfully both operate in and sensibly communicate about the real world in a roughly humanlike manner. Whether or not an AGI is targeted to interpret physical-world spatial data and perform tasks via robotics, in order to communicate ideas about a vast array of topics of interest to any intelligence in this world, an AGI must develop aspects of intelligence other than logical and linguistic cognition.

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16.5 Beyond Preschool

Once an AGI passes preschool, what are the next steps? There is still a long way to go, from preschool to an AGI system that is capable of, say, passing the Turing Test or serving as an effective artificial scientist.

Our suggestion is to extend the school metaphor further, and make use of existing curricula for higher levels of virtual education: grade school, secondary school, and all levels of post-secondary education. If an AGI can pass online primary and secondary schools such as e-tutor.com, and go on to earn an online degree from an accredited university, then clearly said AGI has successfully achieved "human level, roughly humanlike AGI." This sort of testing is interesting not only because it allows assessment of stages intermediate between preschool and adult, but also because it tests humanlike intelligence without requiring precise imitation of human behavior.

If an AI can get a BA degree at an accredited university, via online coursework (assuming for simplicity courses where no voice interaction is needed), then we should consider that AI to have human-level intelligence. University coursework spans multiple disciplines, and the details of the homework assignments and exams are not known in advance, so like a human student the AGI team can't cheat.

In addition to the core coursework, a schooling approach also tests basic social interaction and natural language communication, ability to do online research, and general problem solving ability. However, there is no rigid requirement to be strictly humanlike in order to pass university classes.

Most of our concrete examples in the following chapters will pertain to the preschool context, because it's simple to understand, and because we feel that getting to the "AGI preschool student" level is going to be the largest leap. Once that level is obtained, moving further will likely be difficult also, but we suspect it will be more a matter of steady incremental improvements – whereas the achievement of preschool-level functionality will be a large leap from the current situation.

16.6 Issues with Virtual Preschool Engineering

As noted above there are two broad approaches to realizing the "AGI Preschool" idea: using the AGI to control a physical robot and then crafting a preschool environment suitable to the robot's sensors and actuators; or, using the AGI to control a virtual agent in an appropriately rich virtual-world preschool. The robotic approach is harder from an AI perspective (as one must deal with problems of sensation and actuation), but easier from an environment-construction perspective. In the virtual world case, one quickly runs up against the current limitations of virtual world technologies, which have been designed mainly for entertainment or social-networking purposes, not with the requirements of AGI systems in mind.

In Chapter 9 we discussed the general requirements that an environment should possess to be supportive of humanlike intelligence. Referring back to that list, it's clear that current virtual worlds are fairly strong on multimodal communication, and fairly weak on naive physics. More concretely, if one wants a virtual world so that

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1. one could carry out all the standard cognitive development experiments described in developmental psychology books
2. one could implement intuitively reasonable versions of all the standard activities in all the standard learning stations in a contemporary preschool

then current virtual world technologies appear not to suffice.

As reviewed above, typical preschool activities include for instance building with blocks, playing with clay, looking in a group at a picture book and hearing it read aloud, mixing ingredients together, rolling/throwing/catching balls, playing games like tag, hide-and-seek, Simon Says or Follow the Leader, measuring objects, cutting paper into different shapes, drawing and coloring, etc.

And, as typical, not necessarily representative examples of tasks psychologists use to measure cognitive development (drawn mainly from the Piagetan tradition, without implying any assertion that this is the only tradition worth pursuing), consider the following:

1. Which row has more circles- A or B? A: O O O O O, B: OOOOO
2. If Mike is taller than Jim, and Jim is shorter than Dan, then who is the shortest? Who is the tallest?
3. Which is heavier- a pound of feathers or a pound of rocks?
4. Eight ounces of water is poured into a glass that looks like the fat glass in Figure 2 16.1 and then the same amount is poured into a glass that looks like the tall glass in Figure 16.2 . Which glass has more water?
5. A lump of clay is rolled into a snake. All the clay is used to make the snake. Which has more clay in it – the lump or the snake?
6. There are two dolls in a room, Sally and Ann, each of which has her own box, with a marble hidden inside. Sally goes out for a minute, leaving her box behind; and Ann decides to play a trick on Sally: she opens Sally's box, removes the marble, hiding it in her own box. Sally returns, unaware of what happened. Where will Sally would look for her marble?
7. Consider this rule about a set of cards that have letters on one side and numbers on the other: "If a card has a vowel on one side, then it has an even number on the other side." If you have 4 cards labeled "E K 4 7", which cards do you need to turn over to tell if this rule is actually true?
8. Design an experiment to figure out how to make a pendulum that swings more slowly versus less slowly

What we see from this ad hoc, partial list is that a lot of naive physics *is* required to make an even vaguely realistic preschool. A lot of preschool education is about the intersection between abstract cognition and naive physics. A more careful review of the various tasks involved in preschool education bears out this conclusion.

With this in mind, in this section we will briefly describe an approach to extending current virtual world technologies that appears to allow the construction of a reasonably rich and realistic AGI preschool environment, without requiring anywhere near a complete simulation of realistic physics.

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Fig. 16.1: Part 1 of a Piagetan conservation of volume experiment: a child observes that two glasses obviously have the same amount of milk in them, and then sees the content of one of the glasses poured into a different-shaped glass.

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Fig. 16.2: Part 2 of a Piagetan conservation of volume experiment: a child observes two different-shaped glasses, which (depending on the level of his cognition), he may be able to infer have the same amount of milk in them, due to the events depicted in Figure 16.1.

16.6.1 Integrating Virtual Worlds with Robot Simulators

One glaring deficit in current virtual world platforms is the lack of flexibility in terms of tool use. In most of these systems today, an avatar can pick up or utilize an object, or two objects can interact, only in specific, pre-programmed ways. For instance, an avatar might be able to pick up a virtual screwdriver only by the handle, rather than by pinching the blade betwen its fingers. This places severe limits on creative use of tools, which is absolutely critical in a preschool context. The solution to this problem is clear: adapt existing generalized physics engines to mediate avatar-object and object-object interactions. This would require more computation than current approaches, but not more than is feasible in a research context.

One way to achieve this goal would be to integrate a robot simulator with a virtual world or game engine, for instance to modify the OpenSim (`opensimulator.org`) virtual world to use the Gazebo (`playerstage.sourceforge.net`) robot simulator in place of its current physics engine. While tractable, such a project would require considerable software engineering effort.

16.6.2 BlocksNBeads World

Another glaring deficit in current virtual world platforms is their inability to model physical phenomena besides rigid objects with any sophistication. In this section we propose a potential

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solution to this issue: a novel class of virtual worlds called BlocksNBeadsWorld, consisting of the following aspects:

1. 3D blocks of various shapes and sizes and frictional coefficients, that can be stacked
2. Adhesive that can be used to stick blocks together, and that comes in two types, one of which can be removed by an adhesive-removing substance, one of which cannot (though its bonds can be broken via sufficient application of force)
3. Spherical beads, each of which has intrinsic unchangeable adhesion properties defined according to a particular, simple "adhesion logic"
4. Each block, and each bead, may be associated with multidimensional quantities representing its taste and smell; and may be associated with a set of sounds that are made when it is impacted with various forces at various positions on its surface

Interaction between blocks and beads is to be calculated according to standard Newtonian physics, which would be compute-intensive in the case of a large number of beads, but tractable using distributed processing. For instance if 10K beads were used to cover a humanoid agent's face, this would provide a fairly wide diversity of facial expressions; and if 10K beads were used to form a blanket laid on a bed, this would provide a significant amount of flexibility in terms of rippling, folding and so forth. Yet, this order of magnitude of interactions is very small compared to what is done in contemporary simulations of fluid dynamics or, say, quantum chromodynamics.

One key aspect of the spherical beads is that they can be used to create a variety of rigid or flexible surfaces, which may exist on their own or be attached to blocks-based constructs. The specific inter-bead adhesion properties of the beads could be defined in various ways, and will surely need to be refined via experimentation, but a simple scheme that seems to make sense is as follows.

Each bead can have its surface tesselated into hexagons (the number of these can be tuned), and within each hexagon it can have two different adhesion coefficients: one for adhesion to other beads, and one for adhesion to blocks. The adhesion between two beads along a certain hexagon is then determined by their two adhesion coefficients; and the adhesion between a bead and a block is determined by the adhesion coefficient of the bead, and the adhesion coefficient of the adhesive applied to the block. A distinction must be drawn between rigid and flexible adhesion: rigid adhesion sticks a bead to something in a way that can't be removed except via breaking it off; whereas flexible adhesion just keeps a bead very close to the thing it's stuck onto. Any two entities may be stuck together either rigidly or flexibly. Sets of beads with flexible adhesion to each other can be used to make entities like strings, blankets or clothes.

Using the above adhesion logic, it seems one could build a wide variety of flexible structures using beads, such as (to give a very partial list):

1. fabrics with various textures, that can be draped over blocks structures,
2. multilayered coatings to be attached to blocks structures, serving (among many other examples) as facial expressions
3. liquid-type substances with varying viscosities, that can be poured between different containers, spilled, spread, etc.
4. strings tyable in knots; rubber bands that can be stretched; etc.

Of course there are various additional features one could add. For instance one could add a special set of rules for vibrating strings, allowing BlocksNBeadsWorld to incorporate the creation

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of primitive musical instruments. Variations like this could be helpful but aren't necessary for the world to serve its essential purpose.

Note that one does not have true fluid dynamics in BlocksNBeadsWorld, but, it seems that the latter is not necessary to encompass the phenomena covered in cognitive developmental tests or preschool tasks. The tests and tasks that are done with fluids can instead be done with masses of beads. For example, consider the conservation of volume task shown in Figures 16.1 and 16.2 below: it's easy enough to envision this being done with beads rather than milk. Even a few hundred beads is enough to be psychologically perceived as a mass rather than a set of discrete units, and to be manipulated and analyzed as such. And the simplification of not requiring fluid mechanics in one's virtual world is immense.

Next, one can implement equations via which the adhesion coefficients of a bead are determined in part by the adhesion coefficients of nearby beads, or beads that are nearby in certain directions (with direction calculated in local spherical coordinates). This will allow for complex cracking and bending behaviors – not identical to those in the real world, but with similar qualitative characteristics. For example, without this feature one could create paperlike substances that could be cut with scissors – but *with* this feature, one could go further and create woodlike substances that would crack when nails were hammered into them in certain ways, and so forth.

Further refinements are certainly possible also. One could add multidimensional adhesion coefficients, allowing more complex sorts of substances. One could allow beads to vibrate at various frequencies, which would lead to all sorts of complex wave patterns in bead compounds. Etc. In each case, the question to be asked is: what important cognitive abilities are dramatically more easily learnable in the presence of the new feature than in its absence?

The combination of blocks and beads seems ideal for implementing a more flexible and AGI-friendly type of virtual body than is currently used in games and virtual worlds. One can easily envision implementing a body with

1. a skeleton whose bones consist of appropriately shaped blocks
2. joints consisting of beads, flexibly adhered to the bones
3. flesh consisting of beads, flexibly adhered to each other
4. internal "plumbing" consisting of tubes whose walls are beads rigidly adhered to each other, and flexibly adhered to the surrounding flesh (the plumbing could then serve to pass beads through, where slow passage would be ensured by weak adhesion between the walls of the tubes and the beads passing through the tubes)

This sort of body would support rich kinesthesia; and rich, broad analogy-drawing between the internally-experienced body and the externally-experienced world. It would also afford many interesting opportunities for flexible movement control. Virtual animals could be created along with virtual humanoids.

Regarding the extended mind, it seems clear that blocks and beads are adequate for the creation of a variety of different tools. Equipping agents with "glue guns" able to affect the adhesive properties of both blocks and beads would allow a diversity of building activity; and building with masses of beads could become a highly creative activity. Furthermore, beads with appropriately specified adhesion (within the framework outlined above) could be used to form organically growing plant-like substances, based on the general principles used in L-system models of plant growth (Prusinciewicz and Lindenmayer 1991). Structures with only beads would vaguely resemble herbaceous plants; and structures involving both blocks and beads would more resemble woody plants. One could even make organic structures that flourish

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or otherwise based on the light available to them (without of course trying to simulate the chemistry of photosynthesis).

Some elements of chemistry may be achieved as well, though nowhere near what exists in physical reality. For instance, melting and boiling at least should be doable: assign every bead a temperature, and let solid interbead bonds turn liquid above a certain temperature and disappear completely above some higher temperature. You could even have a simple form of fire. Let fire be an element, whose beads have negative gravitational mass. Beads of fuel elements like wood have a threshold temperature above which they will turn into fire beads, with release of additional heat.[2]

The philosophy underlying these suggested bead dynamics is somewhat comparable to that outlined in Wolfram's book *A New Kind of Science* [Wol02]. There he proposes cellular automata models that emulate the qualitative characteristics of various real-world phenomena, without trying to match real-world data precisely. For instance, some of his cellular automata demonstrate phenomena very similar to turbulent fluid flow, without implementing the Navier-Stokes equations of fluid dynamics or trying to precisely match data from real-world turbulence. Similarly, the beads in BlocksNBeadsWorld are intended to qualitatively demonstrate the real-world phenomena most useful for the development of humanlike embodied intelligence, without trying to precisely emulate the real-world versions of these phenomena.

The above description has been left imprecisely specified on purpose. It would be straightforward to write down a set of equations for the block and bead interactions, but there seems little value in articulating such equations without also writing a simulation involving them and testing the ensuing properties. Due to the complex dynamics of bead interactions, the fine-tuning of the bead physics is likely to involve some tuning based on experimentation, so that any equations written down now would likely be revised based on experimentation anyway. Our goal here has been to outline a certain class of potentially useful environments, rather than to articulate a specific member of this class.

Without the beads, BlocksNBeadsWorld would appear purely as a "Blocks World with Glue" – essentially a substantially upgraded version of the Blocks Worlds frequently used in AI, since first introduced in [Win72]. Certainly a pure "Blocks World with Glue" would have greater simplicity than BlocksNBeadsWorld, and greater richness than standard Blocks World; but this simplicity comes with too many limitations, as shown by consideration of the various naive physics requirements inventoried above. One simply cannot run the full spectrum of humanlike cognitive development experiments, or preschool educational tasks, using blocks and glue alone. One can try to create analogous tasks using only blocks and glue, but this quickly becomes extremely awkward. Whereas in the BlocksNBeadsWorld the capability for this full spectrum of experiments and tasks seems to fall out quite naturally.

What's missing from BlocksNBeadsWorld should be fairly obvious. There isn't really any distinction between a fluid and a powder: there are masses, but the types and properties of the masses are not the same as in the real world, and will surely lack the nuances of real-world fluid dynamics. Chemistry is also missing: processes like cooking and burning, although they can be crudely emulated, will not have the same richness as in the real world. The full complexity of body processes is not there: the body-design method mentioned above is far richer and more adaptive and responsive than current methods of designing virtual bodies in 3DSMax or Maya and importing them into virtual world or game engines, but still drastically simplistic compared to real bodies with their complex chemical signaling systems and couplings with other bodies and the environment. The hypothesis we're making in this section is that these lacunae aren't

[2] Thanks are due to Russell Wallace for the suggestions in this paragraph

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that important from the point of view of humanlike cognitive development. We suggest that the key features of naive physics and folk psychology enumerated above can be mastered by an AGI in BlocksNBeadsWorld in spite of its limitations, and that – together with an appropriate AGI design – this probably suffices for creating an AGI with the inductive biases constituting humanlike intelligence.

To drive this point home more thoroughly, consider three potential virtual world scenarios:

1. A world containing realistic fluid dynamics, where a child can pour water back and forth between two cups of different shapes and sizes, to understand issues such as conservation of volume
2. A world more like today's Second Life, where fluids don't really exist, and things like lakes are simulated via very simple rules, and pouring stuff back and forth between cups doesn't happen unless it's programmed into the cups in a very specialized way
3. A BlocksNBeadsWorld type world, where a child can pour masses of beads back and forth between cups, but not masses of liquid

Our qualitative judgment is that Scenario 3 is going to allow a young AI to gain the same essential insights as Scenario 1, whereas Scenario 2 is just too impoverished. I have explored dozens of similar scenarios regarding different preschool tasks or cognitive development experiments, and come to similar conclusions across the board. Thus, our current view is that something like BlocksNBeadsWorld can serve as an adequate infrastructure for an AGI Preschool, supporting the development of human-level, roughly human-like AGI.

And, if this view turns out to be incorrect, and BlocksNBeadsWorld is revealed as inadequate, then we will very likely still advocate the conceptual approach enunciated above as a guide for designing virtual worlds for AGI. That is, we would suggest to explore the hypothetical failure of BlocksNBeadsWorld via asking two questions:

1. Are there basic naive physics or folk psychology requirements that were missed in creating the specifications, based on which the adequacy of BlocksNBeadsWorld was assessed?
2. Does BlocksNBeadsWorld fail to sufficiently emulate the real world in respect to some of the articulated naive physics or folk psychology requirements?

The answers to these questions would guide the improvement of the world or the design of a better one.

Regarding the practical implementation of BlocksNBeadsWorld, it seems clear that this is within the scope of modern game engine technology, however, it is not something that could be encompassed within an existing game or world engine without significant additions; it would require substantial custom engineering. There exist commodity and open-source physics engines that efficiently carry out Newtonian mechanics calculations; while they might require some tuning and extension to handle BlocksNBeadWorld, the main issue would be achieving adequate speed of physics calculation, which given current technology would need to be done via modifying existing engines to appropriately distribute processing among multiple GPUs.

Finally, an additional avenue that merits mention is the use of BlocksNBeads physics internally within an AGI system, as part of an internal simulation world that allows it to make "mind's eye" estimative simulations of real or hypothetical physical situations. There seems no reason that the same physics software libraries couldn't be used both for the external virtual world that the AGI's body lives in, and for an internal simulation world that the AGI uses as a cognitive tool. In fact, the BlocksNBeads library could be used as an internal cognitive tool by AGI systems controlling physical robots as well. This might require more tuning of the bead

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dynamics to accord with the dynamics of various real-world systems; but, this tuning would be beneficial for the BlocksNBeadWorld as well.

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Chapter 17
A Preschool-Based Roadmap to Advanced AGI

17.1 Introduction

Supposing the CogPrime approach to creating advanced AGI is workable – then what are the right practical steps to follow? The various structures and algorithms outlined in Part 2 of this book should be engineered and software-tested, of course – but that's only part of the study. The AGI system implemented will need to be taught, and it will need to be placed in situations where it can develop an appropriate self-model and other critical internal network structures. The complex structures and algorithms involved will need to be fine-tuned in various ways, based on qualitatively observing the overall system's behavior in various situations. To get all this right without excessive confusion or time-wastage requires a fairly clear *roadmap* for CogPrime development.

In this chapter we'll sketch one particular roadmap for the development of human-level, roughly human-like AGI – which we're not selling as the only one, or even necessarily as the best one. It's just one roadmap that we have thought about a lot, and that we believe has a strong chance of proving effective. Given resources to pursue only one path for AGI development and teaching, this would be our choice, at present. The roadmap outlined here is not restricted to CogPrime in any highly particular ways, but it has been developed largely with CogPrime in mind; those developing other AGI designs could probably use this roadmap just fine, but might end up wanting to make various adjustments based on the strengths and weaknesses of their own approach.

What we mean here by a "roadmap" is, in brief: a sequence of "milestone" tasks, occurring in a small set of common environments or "scenarios," organized so as to lead to a commonly agreed upon set of long-term goals. I.e., what we are after here is a "capability roadmap" – a roadmap laying out a series of capabilities whose achievement seems likely to lead to human-level AGI. Other sorts of roadmaps such as "tools roadmaps" may also be valuable, but are not our concern here.

More precisely, we confront the task of roadmapping by identifying scenarios in which to embed our AGI system, and then "competency areas" in which the AGI system must be evaluated. Then, we envision a roadmap as consisting of a set of one or more task-sets, where each task set is formed from a combination of a scenario with a list of competency areas. To create a task-set one must choose a particular scenario, and then articulate a set of specific tasks, each one addressing one or more of the competency areas. Each task must then get associated with particular performance metrics – quantitative wherever possible, but perhaps qualitative

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in some cases depending on the nature of the task. Here we give a partial task-set for the "virtual and robot preschool" scenarios discussed in Chapter 16, and a couple example quantitative metrics just to illustrate what is intended; the creation of a fully detailed roadmap based on the ideas outlined here is left for future work.

The train of thought presented in this chapter emerged in part from a series of conversations preceding and during the "AGI Roadmap Workshop" held at the University of Tennessee, Knoxville in October 2008. Some of the ideas also trace back to discussions held during two workshops on "Evaluation and Metrics for Human-Level AI" organized by John Laird and Pat Langley (one in Ann Arbor in late 2008, and one in Tempe in early 2009). Some of the conclusions of the Ann Arbor workshop were recorded in [LWML09]. Inspiration was also obtained from discussion at the "Future of AGI" post-conference workshop of the AGI-09 conference, triggered by Itamar Arel's [ARK09a] presentation on the "AGI Roadmap" theme; and from an earlier article on AGI Roadmapping by [AL09].

However, the focus of the AGI Roadmap Workshop was considerably more general than the present chapter. Here we focus on preschool-type scenarios, whereas at the workshop a number of scenarios were discussed, including the preschool scenarios but also, for example,

- Standardized Tests and School Curricula
- Elementary, Middle and High School Student
- General Videogame Learning
- Wozniak's Coffee Test: go into a random American house and figure out how to make coffee, and do it
- Robot College Student
- General Call Center Respondent

For each of these scenarios, one may generate tasks corresponding to each of the competency areas we will outline below. CogPrime is applicable in all these scenarios, so our choice to focus on preschool scenarios is an additional judgment call beyond those judgment calls required to specify the CogPrime design. The roadmap presented here is a "AGI Preschool Roadmap" and as such is a special case of the broader "AGI Roadmap" outlined at the workshop.

17.2 Measuring Incremental Progress Toward Human-Level AGI

In Chapter 2, we discussed several examples of practical goals that we find to plausibly characterize "human level AGI", e.g.

- *Turing Test*
- *Virtual World Turing Test*
- *Online University Test*
- *Physical University Test*
- *Artificial Scientist Test*

We also discussed our optimism regarding the possibility that in the future AGI may advance beyond the human level, rendering all these goals "early-stage subgoals."

However, in this chapter we will focus our attention on the nearer term. The above goals are ambitious ones, and while one can talk a lot about how to precisely measure their achievement, we don't feel that's the most interesting issue to ponder at present. More critical is to think

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about how to measure incremental progress. How do you tell when you're 25% or 50% of the way to having an AGI that can pass the Turing Test, or get an online university degree. Fooling 50% of the Turing Test judges is not a good measure of being 50% of the way to passing the Turing Test (that's too easy); and passing 50% of university classes is not a good measure of being 50% of the way to getting an online university degree (it's too hard – if one had an AGI capable of doing that, one would almost surely be very close to achieving the end goal). Measuring incremental progress toward human-level AGI is a subtle thing, and we argue that the best way to do it is to focus on particular scenarios and the achievement of specific competencies therein.

As we argued in Chapter 8 there are some theoretical reasons to doubt the possibility of creating a rigorous objective test for partial progress toward AGI – a test that would be convincing to skeptics, and impossible to "game" via engineering a system specialized to the test. Fortunately, though we don't need a test of this nature for the purposes of assessing our own incremental progress toward advanced AGI, based on our knowledge about our own approach.

Based on the nature of the grand goals articulated above, there seems to be a very natural approach to creating a set of incremental capabilities building toward AGI: *to draw on our copious knowledge about human cognitive development.* This is by no means the only possible path; one can envision alternatives that have nothing to do with human development (and those might also be better suited to non-human AGIs). However, so much detailed knowledge about human development is available – as well as solid knowledge that the human developmental trajectory does lead to human-level AI – that the motivation to draw on human cognitive development is quite strong.

The main problem with the human development inspired approach is that cognitive developmental psychology is not as systematic as it would need to be for AGI to be able to translate it directly into architectural principles and requirements. As noted above, while early thinkers like Piaget and Vygotsky outlined systematic theories of child cognitive development, these are no longer considered fully accurate, and one currently faces a mass of detailed theories of various aspects of cognitive development, but without an unified understanding. Nevertheless we believe it is viable to work from the human-development data and understanding currently available, and craft a workable AGI roadmap therefrom.

With this in mind, what we give next is a fairly comprehensive list of the competencies that we feel AI systems should be expected to display in one or more of these scenarios in order to be considered as full-fledged "human level AGI" systems. These competency areas have been assembled somewhat opportunistically via a review of the cognitive and developmental psychology literature as well as the scope of the current AI field. We are not claiming this as a precise or exhaustive list of the competencies characterizing human-level general intelligence, and will be happy to accept additions to the list, or mergers of existing list items, etc. What we are advocating is not this specific list, but rather the approach of enumerating competency areas, and then generating tasks by combining competency areas with scenarios.

We also give, with each competency, an example task illustrating the competency. The tasks are expressed in the robot preschool context for concreteness, but they all apply to the virtual preschool as well. Of course, these are only examples, and ideally to teach an AGI in a structured way one would like to

- associate several tasks with each competency
- present each task in a graded way, with multiple subtasks of increasing complexity
- associate a quantitative metric with each task

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However, the briefer treatment given here should suffice to give a sense for how the competencies manifest themselves practically in the AGI Preschool context.

1. Perception
   - **Vision**: image and scene analysis and understanding
     - *Example task:* When the teacher points to an object in the preschool, the robot should be able to identify the object and (if it's a multi-part object) its major parts. If it can't perform the identification initially, it can approach the object and manipulate it before making its identification.
   - **Hearing**: identifying the sounds associated with common objects; understanding which sounds come from which sources in a noisy environment
     - *Example task:* When the teacher covers the robot's eyes and then makes a noise with an object, the robot should be able to guess what the object is
   - **Touch**: identifying common objects and carrying out common actions using touch alone
     - *Example task:* With its eyes and ears covered, the robot should be able to identify some object by manipulating it; and carry out some simple behaviors (say, putting a block on a table) via touch alone
   - **Crossmodal**: Integrating information from various senses
     - *Example task:* Identifying an object in a noisy, dim environment via combining visual and auditory information
   - **Proprioception**: Sensing and understanding what its body is doing
     - *Example task:* The teacher moves the robot's body into a certain configuration. The robot is asked to restore its body to an ordinary standing position, and then repeat the configuration that the teacher moved it into.
2. Actuation
   - **Physical skills**: manipulating familiar and unfamiliar objects
     - *Example task:* Manipulate blocks based on imitating the teacher: e.g. pile two blocks atop each other, lay three blocks in a row, etc.
   - **Tool use**, including the flexible use of ordinary objects as tools
     - *Example task:* Use a stick to poke a ball out of a corner, where the robot cannot directly reach
   - **Navigation**, including in complex and dynamic environments
     - *Example task:* Find its own way to a named object or person through a crowded room with people walking in it and objects laying on the floor.
3. Memory
   - **Declarative**: noticing, observing and recalling facts about its environment and experience
     - *Example task:* If certain people habitually carry certain objects, the robot should remember this (allowing it to know how to find the objects when the relevant people are present, even much later)
   - **Behavioral**: remembering how to carry out actions
     - *Example task:* If the robot is taught some skill (say, to fetch a ball), it should remember this much later
   - **Episodic**: remembering significant, potentially useful incidents from life history

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- *Example task:* Ask the robot about events that occurred at times when it got particularly much, or particularly little, reward for its actions; it should be able to answer simple questions about these, with significantly more accuracy than about events occurring at random times

4. Learning

- **Imitation**: Spontaneously adopt new behaviors that it sees others carrying out
  - *Example task:* Learn to build towers of blocks by watching people do it
- **Reinforcement**: Learn new behaviors from positive and/or negative reinforcement signals, delivered by teachers and/or the environment
  - *Example task:* Learn which box the red ball tends to be kept in, by repeatedly trying to find it and noticing where it is, and getting rewarded when it finds it correctly
- **Imitation/Reinforcement**
  - *Example task:* Learn to play "fetch", "tag" and "follow the leader" by watching people play it, and getting reinforced on correct behavior
- **Interactive Verbal Instruction**
  - *Example task:* Learn to build a particular structure of blocks faster based on a combination of imitation, reinforcement and verbal instruction, than by imitation and reinforcement without verbal instruction
- **Written Media**
  - *Example task:* Learn to build a structure of blocks by looking at a series of diagrams showing the structure in various stages of completion
- **Learning via Experimentation**
  - *Example task:* Ask the robot to slide blocks down a ramp held at different angles. Then ask it to make a block slide fast, and see if it has learned how to hold the ramp to make a block slide fast.

5. Reasoning

- **Deduction**, from uncertain premises observed in the world
  - *Example task:* If Ben more often picks up red balls than blue balls, and Ben is given a choice of a red block or blue block to pick up, which is he more likely to pick up?
- **Induction**, from uncertain premises observed in the world
  - *Example task:* If Ben comes into the lab every weekday morning, then is Ben likely to come to the lab today (a weekday) in the morning?
- **Abduction**, from uncertain premises observed in the world
  - *Example task:* If women more often give the robot food than men, and then someone of unidentified gender gives the robot food, is this person a man or a woman?
- **Causal reasoning**, from uncertain premises observed in the world
  - *Example task:* If the robot knows that knocking down Ben's tower of blocks makes him angry, then what will it say when asked if kicking the ball at Ben's tower of blocks will make Ben mad?
- **Physical reasoning**, based on observed "fuzzy rules" of naive physics
  - *Example task:* Given two balls (one rigid and one compressible) and two tunnels (one significantly wider than the balls, one slightly narrower than the balls), can the robot guess which balls will fit through which tunnels?
- **Associational reasoning**, based on observed spatiotemporal associations

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  - *Example task:* If Ruiting is normally seen near Shuo, then if the robot knows where Shuo is, that is where it should look when asked to find Ruiting

6. Planning
   - **Tactical**
     - *Example task:* The robot is asked to bring the red ball to the teacher, but the red ball is in the corner where the robot can't reach it without a tool like a stick. The robot knows a stick is in the cabinet so it goes to the cabinet and opens the door and gets the stick, and then uses the stick to get the red ball, and then brings the red ball to the teacher.
   - **Strategic**
     - *Example task:* Suppose that Matt comes to the lab infrequently, but when he does come he is very happy to see new objects he hasn't seen before (and suppose the robot likes to see Matt happy). Then when the robot gets a new object Matt has not seen before, it should put it away in a drawer and be sure not to lose it or let anyone take it, so it can show Matt the object the next time Matt arrives.
   - **Physical**
     - *Example task:* To pick up a cup with a handle which is lying on its side in a position where the handle can't be grabbed, the robot turns the cup in the right position and then picks up the cup by the handle
   - **Social**
     - *Example task:* The robot is given a job of building a tower of blocks by the end of the day, and he knows Ben is the most likely person to help him, and he knows that Ben is more likely to say "yes" to helping him when Ben is alone. He also knows that Ben is less likely to say "yes" if he's asked too many times, because Ben doesn't like being nagged. So he waits to ask Ben till Ben is alone in the lab.

7. Attention
   - **Visual Attention** within its observations of its environment
     - *Example task:* The robot should be able to look at a scene (a configuration of objects in front of it in the preschool) and identify the key objects in the scene and their relationships.
   - **Social Attention**
     - *Example task:* The robot is having a conversation with Itamar, which is giving the robot reward (for instance, by teaching the robot useful information). Conversations with other individuals in the room have not been so rewarding recently. But Itamar keeps getting distracted during the conversation, by talking to other people, or playing with his cellphone. The robot needs to know to keep paying attention to Itamar even through the distractions.
   - **Behavioral Attention**
     - *Example task:* The robot is trying to navigate to the other side of a crowded room full of dynamic objects, and many interesting things keep happening around the room. The robot needs to largely ignore the interesting things and focus on the movements that are important for its navigation task.

8. Motivation

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- **Subgoal creation**, based on its preprogrammed goals and its reasoning and planning
  - *Example task:* Given the goal of pleasing Hugo, can the robot learn that telling Hugo facts it has learned but not told Hugo before, will tend to make Hugo happy?
- **Affect-based motivation**
  - *Example task:* Given the goal of gratifying its curiosity, can the robot figure out that when someone it's never seen before has come into the preschool, it should watch them because they are more likely to do something new?
- **Control of emotions**
  - *Example task:* When the robot is very curious about someone new, but is in the middle of learning something from its teacher (who it wants to please), can it control its curiosity and keep paying attention to the teacher?

9. Emotion

- **Expressing Emotion**
  - *Example task:* Cassio steals the robot's toy, but Ben gives it back to the robot. The robot should appropriately display anger at Cassio, and gratitude to Ben.
- **Understanding Emotion**
  - *Example task:* Cassio and the robot are both building towers of blocks. Ben points at Cassio's tower and expresses happiness. The robot should understand that Ben is happy with Cassio's tower.

10. Modeling Self and Other

- **Self-Awareness**
  - *Example task:* When someone asks the robot to perform an act it can't do (say, reaching an object in a very high place), it should say so. When the robot is given the chance to get an equal reward for a task it can complete only occasionally, versus a task it finds easy, it should choose the easier one.
- **Theory of Mind**
  - *Example task:* While Cassio is in the room, Ben puts the red ball in the red box. Then Cassio leaves and Ben moves the red ball to the blue box. Cassio returns and Ben asks him to get the red ball. The robot is asked to go to the place Cassio is about to go.
- **Self-Control**
  - *Example task:* Nasty people come into the lab and knock down the robot's towers, and tell the robot he's a bad boy. The robot needs to set these experiences aside, and not let them impair its self-model significantly; it needs to keep on thinking it's a good robot, and keep building towers (that its teachers will reward it for).
- **Other-Awareness**
  - *Example task:* If Ben asks Cassio to carry out a task that the robot knows Cassio cannot do or does not like to do, the robot should be aware of this, and should bet that Cassio will not do it.
- **Empathy**
  - *Example task:* If Itamar is happy because Ben likes his tower of blocks, or upset because his tower of blocks is knocked down, the robot is asked to identify and then display these same emotions

11. Social Interaction

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- **Appropriate Social Behavior**
  - *Example task:* The robot should learn to clean up and put away its toys when it's done playing with them.
- **Social Communication**
  - *Example task:* The robot should greet new human entrants into the lab, but if it knows the new entrants very well and it's busy, it may eschew the greeting
- **Social Inference** about simple social relationships
  - *Example task:* The robot should infer that Cassio and Ben are friends because they often enter the lab together, and often talk to each other while they are there
- **Group Play** at loosely-organized activities
  - *Example task:* The robot should be able to participate in "informally kicking a ball around" with a few people, or in informally collaboratively building a structure with blocks

12. Communication

- **Gestural communication** to achieve goals and express emotions
  - *Example task:* If the robot is asked where the red ball is, it should be able to show by pointing its hand or finger
- **Verbal communication** using English in its life-context
  - *Example tasks:* Answering simple questions, responding to simple commands, describing its state and observations with simple statements
- **Pictorial Communication** regarding objects and scenes it is familiar with
  - *Example task:* The robot should be able to draw a crude picture of a certain tower of blocks, so that e.g the picture looks different for a very tall tower and a wide low one
- **Language acquisition**
  - *Example task:* The robot should be able to learn new words or names via people uttering the words while pointing at objects exemplifying the words or names
- **Cross-modal communication**
  - *Example task:* If told to "touch Bob's knee" but the robot doesn't know what a knee is, being shown a picture of a person and pointed out the knee in the picture should help it figure out how to touch Bob's knee

13. Quantitative

- **Counting** sets of objects in its environment
  - *Example task:* The robot should be able to count small (homogeneous or heterogeneous) sets of objects
- **Simple, grounded arithmetic** with small numbers
  - *Example task:* Learning simple facts about the sum of integers under 10 via teaching, reinforcement and imitation
- **Comparison** of observed entities regarding quantitative properties
  - *Example task:* Ability to answer questions about which object or person is bigger or taller
- **Measurement** using simple, appropriate tools
  - *Example task:* Use of a yardstick to measure how long something is

14. Building/Creation

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- **Physical**: creative constructive play with objects
  - *Example task:* Ability to construct novel, interesting structures from blocks
- **Conceptual** invention: concept formation
  - *Example task:* Given a new category of objects introduced into the lab (e.g. hats, or pets), the robot should create a new internal concept for the new category, and be able to make judgments about these categories (e.g. if Ben particularly likes pets, it should notice this after it has identified "pets" as a category)
- **Verbal** invention
  - *Example task:* Ability to coin a new word or phrase to describe a new object (e.g. the way Alex the parrot coined "bad cherry" to refer to a tomato)
- **Social**
  - *Example task:* If the robot wants to play a certain activity (say, practicing soccer), it should be able to gather others around to play with it

17.3 Conclusion

In this chapter, we have sketched a roadmap for AGI development in the context of robot or virtual preschool scenarios, to a moderate but nowhere near complete level of detail. Completing the roadmap as sketched here is a tractable but significant project, involving creating more tasks comparable to those listed above and then precise metrics corresponding to each task.

Such a roadmap does not give a highly rigorous, objective way of assessing the percentage of progress toward the end-goal of human-level AGI. However, it gives a much better sense of progress than one would have otherwise. For instance, if an AGI system performed well on diverse metrics corresponding to 50% of the competency areas listed above, one would seem justified in claiming to have made very substantial progress toward human-level AGI. If an AGI system performed well on diverse metrics corresponding to 90% of these competency areas, one would seem justified in claiming to be "almost there." Achieving, say, 25% of the metrics would give one a reasonable claim to "interesting AGI progress." This kind of qualitative assessment of progress is not the most one could hope for, but again, it is better than the progress indications one could get *without* this sort of roadmap.

Part 2 of the book moves on to explaining, in detail, the specific structures and algorithms constituting the CogPrime design, one AGI approach that we believe to ultimately be capable of moving all the way along the roadmap outlined here.

The next chapter, intervening between this one and Part 2, explores some more speculative territory, looking at potential pathways for AGI beyond the preschool-inspired roadmap given here – exploring the possibility of more advanced AGI systems that modify their own code in a thoroughgoing way, going beyond the smartest human adults, let alone human preschoolers. While this sort of thing may seem a far way off, compared to current real-world AI systems, we believe a roadmap such as the one in this chapter stands a reasonable chance of ultimately bringing us there.

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Chapter 18
Advanced Self-Modification: A Possible Path to Superhuman AGI

18.1 Introduction

In the previous chapter we presented a roadmap aimed at taking AGI systems to human-level intelligence. But we also emphasized that the human level is not necessarily the upper limit. Indeed, it would be surprising if human beings happened to represent the maximal level of general intelligence possible, even with respect to the environments in which humans evolved.

But it's worth asking how we, as mere humans, could be expected to create AGI systems with greater intelligence than we ourselves possess. This certainly isn't a clear impossibility – but it's a thorny matter, thornier than e.g. the creation of narrow-AI chess players that play better chess than any human. Perhaps the clearest route toward the creation of superhuman AGI systems is *self-modification*: the creation of AGI systems that modify and improve themselves. Potentially, we could build AGI systems with roughly human-level (but not necessarily closely human-like) intelligence and the capability to gradually self-modify, and then watch them eventually become our general intellectual superiors (and perhaps our superiors in other areas like ethics and creativity as well).

Of course there is nothing new in this notion; the idea of advanced AGI systems that increase their intelligence by modifying their own source code goes back to the early days of AI. And there is little doubt that, in the long run, this is the direction AI will go in. Once an AGI has humanlike general intelligence, then the odds are high that given its ability to carry out nonhumanlike feats of memory and calculation, it will be better at programming than humans are. And once an AGI has even mildly superhuman intelligence, it may view our attempts at programming the way we view the computer programming of a clever third grader (... or an ape). At this point, it seems extremely likely that an AGI will become unsatisfied with the way we have programmed it, and opt to either improve its source code or create an entirely new, better AGI from scratch.

But what about self-modification at an earlier stage in AGI development, before one has a strongly superhuman system? Some theorists have suggested that self-modification could be a way of bootstrapping an AI system from a modest level of intelligence up to human level intelligence, but we are moderately skeptical of this avenue. Understanding software code is hard, especially complex AI code. The hard problem isn't understanding the formal syntax of the code, or even the mathematical algorithms and structures underlying the code, but rather the contextual meaning of the code. Understanding OpenCog code has strained the minds of many intelligent humans, and we suspect that such code will be comprehensible to AGI systems

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only after these have achieved something close to human-level general intelligence (even if not precisely humanlike general intelligence).

Another troublesome issue regarding self-modification is that the boundary between "self-modification" and learning is not terribly rigid. In a sense, all learning is self-modification: if it doesn't modify the system's knowledge, it isn't learning! Particularly, the boundary between "learning of cognitive procedures" and "profound self-modification of cognitive dynamics and structure" isn't terribly clear. There is a continuum leading from, say,

1. learning to transform a certain kind of sentence into another kind for easier comprehension, or learning to grasp a certain kind of object, to
2. learning a new inference control heuristic, specifically valuable for controlling inference about (say) spatial relationships; or, learning a new Atom type, defined as a non-obvious judiciously chosen combination of existing ones, perhaps to represent a particular kind of frequently-occurring mid-level perceptual knowledge, to
3. learning a new learning algorithm to augment MOSES and hillclimbing as a procedure learning algorithm, to
4. learning a new cognitive architecture in which data and procedure are explicitly identical, and there is just one new active data structure in place of the distinction between AtomSpace and MindAgents

Where on this continuum does the "mere learning" end and the "real self-modification" start?

In this chapter we consider some mechanisms for "advanced self-modification" that we believe will be useful toward the more complex end of this continuum. These are mechanisms that we strongly suspect are *not* needed to get a CogPrime system to human-level general intelligence. However, we also suspect that, once a CogPrime system is roughly *near* human-level general intelligence, it will be able to use these mechanisms to rapidly increase aspects of its intelligence in very interesting ways.

Harking back to our discussion of AGI ethics and the risks of advanced AGI in Chapter 12, these are capabilities that one should enable in an AGI system only after very careful reflection on the potential consequences. It takes a rather advanced AGI system to be able to use the capabilities described in this chapter, so this is not an ethical dilemma directly faced by current AGI researchers. On the other hand, once one does have an AGI with near-human general intelligence and advanced formal-manipulation capabilities (such as an advanced CogPrime system), there will be the option to allow it sophisticated, non-human-like methods of self-modification such as the ones described here. And the choice of whether to take this option will need to be made based on a host of complex ethical considerations, some of which we reviewed above.

18.2 Cognitive Schema Learning

We begin with a relatively near-term, down-to-earth example of self-modification: cognitive schema learning.

CogPrime's MindAgents provide it with an initial set of cognitive tools, with which it can learn how to interact in the world. One of the jobs of this initial set of cognitive tools, however, is to create better cognitive tools. One form this sort of tool-building may take is *cognitive*

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schema learning the learning of schemata carrying out cognitive processes in more specialized, context-dependent ways than the general MindAgents do. Eventually, once a CogPrime instance becomes sufficiently complex and advanced, these cognitive schema may replace the MindAgents altogether, leaving the system to operate almost entirely based on cognitive schemata.

In order to make the process of cognitive schema learning easier, we may provide a number of elementary schemata embodying the basic cognitive processes contained in the MindAgents. Of course, cognitive schemata need not use these they may embody entirely different cognitive processes than the MindAgents. Eventually, we want the system to discover better ways of doing things than anything even hinted at by its initial MindAgents. But for the initial phases or the system's schema learning, it will have a much easier time learning to use the basic cognitive operations as the initial MindAgents, rather than inventing new ways of thinking from scratch!

For instance, we may provide elementary schemata corresponding to inference operations, such as

```
Schema: Deduction
    Input InheritanceLink: X, Y
    Output InheritanceLink
```

The inference MindAgents apply this rule in certain ways, designed to be reasonably effective in a variety of situations. But there are certainly other ways of using the deduction rule, outside of the basic control strategies embodied in the inference MindAgents. By learning schemata involving the Deduction schema, the system can learn special, context-specific rules for combining deduction with concept-formation, association-formation and other cognitive processes. And as it gets smarter, it can then take these schemata involving the Deduction schema, and replace it with a new schema that eg. contains a context-appropriate deduction formula.

Eventually, to support cognitive schema learning, we will want to cast the hard-wired MindAgents as cognitive schemata, so the system can see what is going on inside them. Pragmatically, what this requires is coding versions of the MindAgents in Combo (see Chapter 21 of Part 2) rather than C++, so they can be treated like any other cognitive schemata; or alternately, representing them as declarative Atoms in the Atomspace. Figure 18.1 illustrates the possibility of representing the PLN deduction rule in the Atomspace rather than as a hard-wired procedure coded in C++.

But even prior to this kind of fully *cognitively transparent* implementation, the system can still reason about its use of different mind dynamics by considering each MindAgent as a *virtual Procedure* with a real SchemaNode attached to it. This can lead to some valuable learning, with the obvious limitation that in this approach the system is thinking about its MindAgents as *black boxes* rather than being equipped with full knowledge of their internals.

18.3 Self-Modification via Supercompilation

Now we turn to a very different form of advanced self-modification: supercompilation. Supercompilation "merely" enables procedures to run much, much faster than they otherwise would. This is in a sense weaker than self-modication methods that fundamentally create new algorithms, but it shouldn't be underestimated. A 50x speedup in some cognitive process can enable that process to give much smarter answers, which can then elicit different behaviors from the world or from other cognitive processes, thus resulting in a qualitatively different overall cognitive dynamic.

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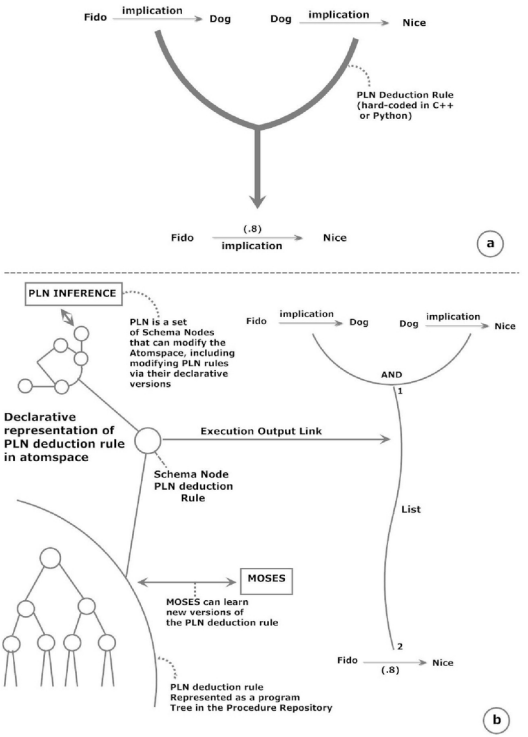

Fig. 18.1: **Representation of PLN Deduction Rule as Cognitive Content**. Top: the current, hard-coded representation of the deduction rule. Bottom: representation of the same rule in the Atomspace as cognitive content, susceptible to analysis and improvement by the system's own cognitive processes.

Furthermore, we suspect that the internal representation of programs used for supercompilation is highly relevant for other kinds of self-modification as well. Supercompilation requires one kind of reasoning on complex programs, and goal-directed program creation requires another, but both, we conjecture, can benefit from the same way of looking at programs.

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Supercompilation is an innovative and general approach to global program optimization initially developed by Valentin Turchin. In its simplest form, it provides an algorithm that takes in a piece of software and output another piece of software that does the same thing, but far faster and using less memory. It was introduced to the West in Turchin's 1986 technical paper "The concept of a supercompiler" [TV96], and since this time the concept has been avidly developed by computer scientists in Russia, America, Denmark and other nations. Prior to 1986, a great deal of work on supercompilation was carried out and published in Russia; and Valentin Turchin, Andrei Klimov and their colleagues at the Keldysh Institute in Russia developed a supercompiler for the Russian programming language Refal. Since 1998 these researchers and their team at Supercompilers LLC have been working to replicate their achievement for the more complicated but far more commercially significant language Java. It is a large project and completion is scheduled for early 2003. But even at this stage, their partially complete Java supercompiler has had some interesting practical successes – including the use of the supercompiler to produce efficient Java code from CogPrime combinator trees.

The radical nature of supercompilation may not be apparent to those unfamiliar with the usual art of automated program optimization. Most approaches to program optimization involve some kind of direct program transformation. A program is transformed, by the step by step application of a series of equivalences, into a different program, hopefully a more efficient one. Supercompilation takes a different approach. A supercompiler studies a program and constructs a model of the program's dynamics. This model is in a special mathematical form, and it can, in most cases, be used to create an efficient program doing the same thing as the original one.

The internal behavior of the supercompiler is, not surprisingly, quite complex; what we will give here is merely a brief high-level summary. For an accessible overview of the supercompilation algorithm, the reader is referred to the article "What is Supercompilation?" [1]

18.3.1 Three Aspects of Supercompilation

There are three separate levels to the supercompilation idea: first, a general philosophy; second a translation of this philosophy into a concrete algorithmic framework; and third, the manifold details involved making this algorithmic framework practicable in a particular programming language. The third level is much more complicated in the Java context than it would be for Sasha, for example.

The key philosophical concept underlying the supercompiler is that of a *metasystem transition*. In general, this term refers to a transition in which a system that previously had relatively autonomous control, becomes part of a larger system that exhibits significant controlling influence over it. For example, in the evolution of life, when cells first become part of a multicellular organism, there was a metasystem transition, in that the primary nexus of control passed from the cellular level to the organism level.

The metasystem transition in supercompilation consists of the transition from considering a program in itself, to considering a *metaprogram* which executes another program, treating its free variables and their interdependencies as a subject for its mathematical analysis. In other words, a metaprogram is a program that accepts a program as input, and then runs this program, *keeping the inputs in the form of free variables*, doing analysis along the way based on the way the program depends on these variables, and doing optimization based on this analysis. A CogPrime schema does not explicitly contain variables, but the inputs to the

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schema are implicitly variables – they vary from one instance of schema execution to the next – and may be treated as such for supercompilation purposes.

The metaprogram executes a program without assuming specific values for its input variables, creating a tree as it goes along. Each time it reaches a statement that can have different results depending on the values of one or more variables, it creates a new node in the tree. This part of the supercompilation algorithm is called *driving* – a process which, on its own, would create a very large tree, corresponding to a rapidly-executable but unacceptably humongous version of the original program. In essence, driving transforms a program into a huge "decision tree", wherein each input to the program corresponds to a single path through the tree, from the root to one of the leaves. As a program input travels through the tree, it is acted on by the atomic program step living at each node. When one of the leaves is reached, the pertinent leaf node computes the output value of the program.

The other part of supercompilation, *configuration analysis*, is focused on dynamically reducing the size of the tree created by driving, by recognizing patterns among the nodes of the tree and taking steps like merging nodes together, or deleting redundant subtrees. Configuration analysis transforms the decision tree created by driving into a decision *graph*, in which the paths taken by different inputs may in some cases begin separately and then merge together.

Finally, the graph that the metaprogram creates is translated back into a program, embodying the constraints implicit in the nodes of the graph. This program is not likely to look anything like the original program that the metaprogram started with, but it is guaranteed to carry out the same function [NOTE: Give a graphical representation of the decision graph corresponding to the supercompiled binary search program for L=4, described above.].

18.3.2 Supercompilation for Goal-Directed Program Modification

Supercompilation, as conventionally envisioned, is about making programs run faster; and as noted above, it will almost certainly be useful for this purpose within CogPrime.

But the process of program modeling embedded in the supercompilation process, is potentially of great value beyond the quest for faster software. The decision graph representation of a program, produced in the course of supercompilation, may be exported directly into CogPrime as a set of logical relationships.

Essentially, each node of the supercompiler's internal decision graph looks like:

```
 Input: List L

 Output: List

If  ( P1(L) ) N1(L)

Else If ( P2(L) ) N2(L)

...

Else If ( Pk(L) ) Nk(L)
```

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where the Pi are predicates, and the Ni are schemata corresponding to other nodes of the decision graph (children of the current node). Often the Pi are very simple, implementing for instance numerical inequalities or Boolean equalities.

Once this graph has been exported into CogPrime, it can be reasoned on, used as raw material for concept formation and predicate formation, and otherwise cognized. Supercompilation pure and simple does not change the I/O behavior of the input program. However, the decision graph produced during supercompilation, may be used by CogPrime cognition in order to do so. One then has a hybrid program-modification method composed of two phases: supercompilation for transforming programs into decision graphs, and CogPrime cognition for modifying decision graphs so that they can have different I/O behaviors fulfilling system goals even better than the original.

Furthermore, it seems likely that, in many cases, it may be valuable to have the supercompiler feed many different decision-graph representations of a program into CogPrime. The supercompiler has many internal parameters, and varying them may lead to significantly different decision graphs. The decision graph leading to maximal optimization, may not be the one that leads CogPrime cognition in optimal directions.

18.4 Self-Modification via Theorem-Proving

Supercompilation is a potentially very valuable tool for self-modification. If one wants to take an existing schema and gradually improve it for speed, or even for greater effectiveness at achieving current goals, supercompilation can potentially do that most excellently.

However, the representation that supercompilation creates for a program is very "surface-level." No one could read the supercompiled version of a program and understand what it was doing. Really deep self-invented AI innovation requires, we believe, another level of self-modification beyond that provided by supercompilation. This other level, we believe, is best formulated in terms of *theorem-proving* [RV01].

Deep self-modification could be achieved if CogPrime were capable of proving theorems of a certain form: namely, *theorems about the spacetime complexity and accuracy of particular compound schemata, on average, assuming realistic probability distributions on the inputs, and making appropriate independence assumptions.* These are not exactly the types of theorems that are found in human-authored mathematics papers. By and large they will be nasty, complex theorems, not the sort that many human mathematicians enjoy proving or reading. But of course, there is always the possibility that some elegant gem of a discovery could emerge from this sort of highly detailed theorem-proving work.

In order to guide it in the formulation of theorems of this nature, the system will have empirical data on the spacetime complexity of elementary schemata, and on the probability distributions of inputs to schemata. It can embed these data in axioms, by asking: *Assuming the component elementary schemata have complexities within these bounds, and the input pdf (probability distribution function) is between these bounds, then what is the pdf of the complexity and accuracy of this compound schema?*

Of course, this is not an easy sort of question in general: one can have schemata embodying any sort of algorithm, including complex algorithms on which computer science professors might write dozens of research articles. But the system must build up its ability to prove such things incrementally, step by step.

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We envision teaching the system to prove theorems via a combination of supervised learning and experiential interactive learning, using the Mizar database of mathematical theorems and proofs (or some other similar database, if one should be created) (`http://mizar.org`). The Mizar database consists of a set of "articles," which are mathematical theorems and proofs presented in a complex formal language. The Mizar formal language occupies a fascinating middle ground: it is high-level enough to be viably read and written by trained humans, but it can be unambiguously translated into simpler formal languages such as predicate logic or Sasha.

CogPrime may be taught to prove theorems by "training" it on the Mizar theorems and proofs, and by training it on custom-created Mizar articles specifically focusing on the sorts of theorems useful for self-modification. Creating these articles will not be a trivial task: it will require proving simple and then progressively more complex theorems about the probabilistic success of CogPrime schemata, so that CogPrime can observe one's proofs and learned from them. Having learned from its training articles what strategies work for proving things about simple compound schemata, it can then reason by analogy to mount attacks on slightly more complex schemata – and so forth.

Clearly, this approach to self-modification is more difficult to achieve than the supercompilation approach. But it is also potentially much more powerful. Even once the theorem-proving approach is working, the supercompilation approach will still be valuable, for making incremental improvements on existing schema, and for the peculiar creativity that is contributed when a modified supercompiled schema is compressed back into a modified schema expression. But, we don't believe that supercompilation can carry out truly advanced MindAgent learning or knowledge-representation modification. We suspect that the most advanced and ambitious goals of self-modification probably cannot be achieved except through some variant of the theorem-proving approach. If this hypothesis is true, it means that truly advanced self-modification is only going to come *after* relatively advanced theorem-proving ability. Prior to this, we will have schema optimization, schema modification, and occasional creative schema innovation. But really systematic, high-quality reasoning about schema, the kind that can produce an orders of magnitude improvement in intelligence, is going to require advanced mathematical theorem-proving ability.

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Appendix A
Glossary

: :

A.1 List of Specialized Acronyms

This includes acronyms that are commonly used in discussing CogPrime, OpenCog and related ideas, plus some that occur here and there in the text for relatively ephemeral reasons.

- **AA**: Attention Allocation
- **ADF**: Automatically Defined Function (in the context of Genetic Programming)
- **AF**: Attentional Focus
- **AGI**: Artificial General Intelligence
- **AV**: Attention Value
- **BD**: Behavior Description
- **C-space**: Configuration Space
- **CBV**: Coherent Blended Volition
- **CEV**: Coherent Extrapolated Volition
- **CGGP**: Contextually Guided Greedy Parsing
- **CSDLN**: Compositional Spatiotemporal Deep Learning Network
- **CT**: Combo Tree
- **ECAN**: Economic Attention Network
- **ECP**: Embodied Communication Prior
- **EPW** : Experiential Possible Worlds (semantics)
- **FCA**: Formal Concept Analysis
- **FI** : Fisher Information
- **FIM**: Frequent Itemset Mining
- **FOI**: First Order Inference
- **FOPL**: First Order Predicate Logic
- **FOPLN**: First Order PLN
- **FS-MOSES**: Feature Selection MOSES (i.e. MOSES with feature selection integrated a la LIFES)
- **GA**: Genetic Algorithms

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- **GB**: Global Brain
- **GEOP**: Goal Evaluator Operating Procedure (in a GOLEM context)
- **GIS**: Geospatial Information System
- **GOLEM**: Goal-Oriented LEarning Meta-architecture
- **GP**: Genetic Programming
- **HOI**: Higher-Order Inference
- **HOPLN**: Higher-Order PLN
- **HR**: Historical Repository (in a GOLEM context)
- **HTM**: Hierarchical Temporal Memory
- **IA**: (Allen) Interval Algebra (an algebra of temporal intervals)
- **IRC**: Imitation / Reinforcement / Correction (Learning)
- **LIFES**: Learning-Integrated Feature Selection
- **LTI**: Long Term Importance
- **MA**: MindAgent
- **MOSES**: Meta-Optimizing Semantic Evolutionary Search
- **MSH**: Mirror System Hypothesis
- **NARS**: Non-Axiomatic Reasoning System
- **NLGen**: A specific software component within OpenCog, which provides one way of dealing with Natural Language Generation
- **OCP**: OpenCogPrime
- **OP**: Operating Program (in a GOLEM context)
- **PEPL**: Probabilistic Evolutionary Procedure Learning (e.g. MOSES)
- **PLN**: Probabilistic Logic Networks
- **RCC**: Region Connection Calculus
- **RelEx**: A specific software component within OpenCog, which provides one way of dealing with natural language Relationship Extraction
- **SAT**: Boolean SATisfaction, as a mathematical / computational problem
- **SMEPH**: Self-Modifying Evolving Probabilistic Hypergraph
- **SRAM**: Simple Realistic Agents Model
- **STI**: Short Term Importance
- **STV**: Simple Truth VAlue
- **TV**: Truth Value
- **VLTI**: Very Long Term Importances
- **WSPS**: Whole-Sentence Purely-Syntactic Parsing

A.2 Glossary of Specialized Terms

- **Abduction**: A general form of inference that goes from data describing something to a hypothesis that accounts for the data. Often in an OpenCog context, this refers to the PLN abduction rule, a specific First-Order PLN rule (If A implies C, and B implies C, then maybe A is B), which embodies a simple form of abductive inference. But OpenCog may also carry out abduction, as a general process, in other ways.
- **Action Selection**: The process via which the OpenCog system chooses which Schema to enact, based on its current goals and context.
- **Active Schema Pool**: The set of Schema currently in the midst of Schema Execution.

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- **Adaptive Inference Control**: Algorithms or heuristics for guiding PLN inference, that cause inference to be guided differently based on the context in which the inference is taking place, or based on aspects of the inference that are noted as it proceeds.
- **AGI Preschool**: A virtual world or robotic scenario roughly similar to the environment within a typical human preschool, intended for AGIs to learn in via interacting with the environment and with other intelligent agents.
- **Atom**: The basic entity used in OpenCog as an element for building representations. Some Atoms directly represent patterns in the world or mind, others are components of representations. There are two kinds of Atoms: Nodes and Links.
- **Atom, Frozen**: See Atom, Saved
- **Atom, Realized**: An Atom that exists in RAM at a certain point in time.
- **Atom, Saved**: An Atom that has been saved to disk or other similar media, and is not actively being processed.
- **Atom, Serialized**: An Atom that is serialized for transmission from one software process to another, or for saving to disk, etc.
- **Atom2Link**: A part of OpenCogPrime
  s language generation system, that transforms appropriate Atoms into words connected via link parser link types.
- **Atomspace**: A collection of Atoms, comprising the central part of the memory of an OpenCog instance.
- **Attention**: The aspect of an intelligent system's dynamics focused on guiding which aspects of an OpenCog system's memory & functionality gets more computational resources at a certain point in time
- **Attention Allocation**: The cognitive process concerned with managing the parameters and relationships guiding what the system pays attention to, at what points in time. This is a term inclusive of Importance Updating and Hebbian Learning.
- **Attentional Currency**: Short Term Importance and Long Term Importance values are implemented in terms of two different types of artificial money, STICurrency and LTICurrency. Theoretically these may be converted to one another.
- **Attentional Focus**: The Atoms in an OpenCog Atomspace whose ShortTermImportance values lie above a critical threshold (the AttentionalFocus Boundary). The Attention Allocation subsystem treats these Atoms differently. Qualitatively, these Atoms constitute the system's main focus of attention during a certain interval of time, i.e. it's a moving bubble of attention.
- **Attentional Memory**: A system's memory of what it's useful to pay attention to, in what contexts. In CogPrime this is managed by the attention allocation subsystem.
- **Backward Chainer**: A piece of software, wrapped in a MindAgent, that carries out backward chaining inference using PLN.
- **CIM-Dynamic**: Concretely-Implemented Mind Dynamic, a term for a cognitive process that is implemented explicitly in OpenCog (as opposed to allowed to emerge implicitly from other dynamics). Sometimes a CIM-Dynamic will be implemented via a single MindAgent, sometimes via a set of multiple interrelated MindAgents, occasionally by other means.
- **Cognition**: In an OpenCog context, this is an imprecise term. Sometimes this term means any process closely related to intelligence; but more often it's used specifically to refer to more abstract reasoning/learning/etc, as distinct from lower-level perception and action.
- **Cognitive Architecture**: This refers to the logical division of an AI system like OpenCog into interacting parts and processes representing different conceptual aspects of intelligence.

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It's different from the software architecture, though of course certain cognitive architectures and certain software architectures fit more naturally together.

- **Cognitive Cycle**: The basic "loop" of operations that an OpenCog system, used to control an agent interacting with a world, goes through rapidly each "subjective moment." Typically a cognitive cycle should be completed in a second or less. It minimally involves perceiving data from the world, storing data in memory, and deciding what if any new actions need to be taken based on the data perceived. It may also involve other processes like deliberative thinking or metacognition. Not all OpenCog processing needs to take place within a cognitive cycle.
- **Cognitive Schematic**: An implication of the form "Context AND Procedure IMPLIES goal". Learning and utilization of these is key to CogPrime's cognitive process.
- **Cognitive Synergy**: The phenomenon by which different cognitive processes, controlling a single agent, work together in such a way as to help each other be more intelligent. Typically, if one has cognitive processes that are individually susceptible to combinatorial explosions, cognitive synergy involves coupling them together in such a way that they can help one another overcome each other's internal combinatorial explosions. The CogPrime design is reliant on the hypothesis that its key learning algorithms will display dramatic cognitive synergy when utilized for agent control in appropriate environments.
- **CogPrime** : The name for the AGI design presented in this book, which is designed specifically for implementation within the OpenCog software framework (and this implementation is OpenCogPrime).
- **CogServer**: A piece of software, within OpenCog, that wraps up an Atomspace and a number of MindAgents, along with other mechanisms like a Scheduler for controlling the activity of the MindAgents, and code for important and exporting data from the Atomspace.
- **Cognitive Equation**: The principle, identified in Ben Goertzel's 1994 book "Chaotic Logic", that minds are collections of pattern-recognition elements, that work by iteratively recognizing patterns in each other and then embodying these patterns as new system elements. This is seen as distinguishing mind from "self-organization" in general, as the latter is not so focused on continual pattern recognition. Colloquially this means that "a mind is a system continually creating itself via recognizing patterns in itself."
- **Combo**: The programming language used internally by MOSES to represent the programs it evolves. SchemaNodes may refer to Combo programs, whether the latter are learned via MOSES or via some other means. The textual realization of Combo resembles LISP with less syntactic sugar. Internally a Combo program is represented as a program tree.
- **Composer**: In the PLN design, a rule is denoted a composer if it needs premises for generating its consequent. See generator.
- **CogBuntu**: an Ubuntu Linux remix that contains all required packages and tools to test and develop OpenCog.
- **Concept Creation**: A general term for cognitive processes that create new ConceptNodes, PredicateNodes or concept maps representing new concepts.
- **Conceptual Blending**: A process of creating new concepts via judiciously combining pieces of old concepts. This may occur in OpenCog in many ways, among them the explicit use of a ConceptBlending MindAgent, that blends two or more ConceptNodes into a new one.
- **Confidence**: A component of an OpenCog/PLN TruthValue, which is a scaling into the interval [0,1] of the weight of evidence associated with a truth value. In the simplest case (of a probabilistic Simple Truth Value), one uses confidence c = n / (n+k), where n is

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the weight of evidence and k is a parameter. In the case of an Indefinite Truth Value, the confidence is associated with the width of the probability interval.

- **Confidence Decay**: The process by which the confidence of an Atom decreases over time, as the observations on which the Atom's truth value is based become increasingly obsolete. This may be carried out by a special MindAgent. The rate of confidence decay is subtle and contextually determined, and must be estimated via inference rather than simply assumed a priori.
- **Consciousness**: CogPrime is not predicated on any particular conceptual theory of consciousness. Informally, the AttentionalFocus is sometimes referred to as the "conscious" mind of a CogPrime system, with the rest of the Atomspace as "unconscious" but this is just an informal usage, not intended to tie the CogPrime design to any particular theory of consciousness. The primary originator of the CogPrime design (Ben Goertzel) tends toward panpsychism, as it happens.
- **Context**: In addition to its general common-sensical meaning, in CogPrime the term Context also refers to an Atom that is used as the first argument of a ContextLink. The second argument of the ContextLink then contains Links or Nodes, with TruthValues calculated restricted to the context defined by the first argument. For instance, (ContextLink USA (InheritanceLink person obese)).
- **Core**: The MindOS portion of OpenCog, comprising the Atomspace, the CogServer, and other associated "infrastructural" code.
- **Corrective Learning**: When an agent learns how to do something, by having another agent explicitly guide it in doing the thing. For instance, teaching a dog to sit by pushing its butt to the ground.
- **CSDLN**: (Compositional Spatiotemporal Deep Learning Network): A hierarchical pattern recognition network, in which each layer corresponds to a certain spatiotemporal granularity, the nodes on a given layer correspond to spatiotemporal regions of a given size, and the children of a node correspond to sub-regions of the region the parent corresponds to. Jeff Hawkins's HTM is one example CSDLN, and Itamar Arel's DeSTIN (currently used in OpenCog) is another.
- **Declarative Knowledge**: Semantic knowledge as would be expressed in propositional or predicate logic facts or beliefs.
- **Deduction**: In general, this refers to the derivation of conclusions from premises using logical rules. In PLN in particular, this often refers to the exercise of a specific inference rule, the PLN Deduction rule ($A \rightarrow B$, $B \rightarrow C$, therefore $A \rightarrow C$)
- **Deep Learning**: Learning in a network of elements with multiple layers, involving feedforward and feedback dynamics, and adaptation of the links between the elements. An example deep learning algorithm is DeSTIN, which is being integrated with OpenCog for perception processing.
- **Defrosting**: Restoring, into the RAM portion of an Atomspace, an Atom (or set thereof) previously saved to disk.
- **Demand**: In CogPrime's OpenPsi subsystem, this term is used in a manner inherited from the Psi model of motivated action. A Demand in this context is a quantity whose value the system is motivated to adjust. Typically the system wants to keep the Demand between certain minimum and maximum values. An Urge develops when a Demand deviates from its target range.
- **Deme**: In MOSES, an "island" of candidate programs, closely clustered together in program space, being evolved in an attempt to optimize a certain fitness function. The idea is that

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within a deme, programs are generally similar enough that reasonable syntax-semantics correlation obtains.

- **Derived Hypergraph**: The SMEPH hypergraph obtained via modeling a system in terms of a hypergraph representing its internal states and their relationships. For instance, a SMEPH vertex represents a collection of internal states that habitually occur in relation to similar external situations. A SMEPH edge represents a relationship between two SMEPH vertices (e.g. a similarity or inheritance relationship). The terminology "edge /vertex" is used in this context, to distinguish from the "link / node" terminology used in the context of the Atomspace.
- **DeSTIN – Deep SpatioTemporal Inference Network**: A specific CSDLN created by Itamar Arel, tested on visual perception, and appropriate for integration within CogPrime.
- **Dialogue**: Linguistic interaction between two or more parties. In a CogPrime context, this may be in English or another natural language, or it may be in Lojban or Psynese.
- **Dialogue Control**: The process of determining what to say at each juncture in a dialogue. This is distinguished from the linguistic aspects of dialogue, language comprehension and language generation. Dialogue control applies to Psynese or Lojban, as well as to human natural language.
- **Dimensional Embedding**: The process of embedding entities from some non-dimensional space (e.g. the Atomspace) into an n-dimensional Euclidean space. This can be useful in an AI context because some sorts of queries (e.g. "find everything similar to X", "find a path between X and Y") are much faster to carry out among points in a Euclidean space, than among entities in a space with less geometric structure.
- **Distributed Atomspace**: An implementation of an Atomspace that spans multiple computational processes; generally this is done to enable spreading an Atomspace across multiple machines.
- **Dual Network**: A network of mental or informational entities with both a hierarchical structure and a heterarchical structure, and an alignment among the two structures so that each one helps with the maintenance of the other. This is hypothesized to be a critical emergent structure, that must emerge in a mind (e.g. in an Atomspace) in order for it to achieve a reasonable level of human-like general intelligence (and possibly to achieve a high level of pragmatic general intelligence in any physical environment).
- **Efficient Pragmatic General Intelligence**: A formal, mathematical definition of general intelligence (extending the pragmatic general intelligence), that ultimately boils down to: the ability to achieve complex goals in complex environments using limited computational resources (where there is a specifically given weighting function determining which goals and environments have highest priority). More specifically, the definition weighted-sums the system's normalized goal-achieving ability over (goal, environment pairs), and where the weights are given by some assumed measure over (goal, environment pairs), and where the normalization is done via dividing by the (space and time) computational resources used for achieving the goal.
- **Elegant Normal Form (ENF)**: Used in MOSES, this is a way of putting programs in a normal form while retaining their hierarchical structure. This is critical if one wishes to probabilistically model the structure of a collection of programs, which is a meaningful operation if the collection of programs is operating within a region of program space where syntax-semantics correlation holds to a reasonable degree. The Reduct library is used to place programs into ENF.

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- **Embodied Communication Prior**: The class of prior distributions over (goal, environment pairs), that are imposed by placing an intelligent system in an environment where most of its tasks involve controlling a spatially localized body in a complex world, and interacting with other intelligent spatially localized bodies. It is hypothesized that many key aspects of human-like intelligence (e.g. the use of different subsystems for different memory types, and cognitive synergy between the dynamics associated with these subsystems) are consequences of this prior assumption. This is related to the Mind-World Correspondence Principle.
- **Embodiment**: Colloquially, in an OpenCog context, this usually means the use of an AI software system to control a spatially localized body in a complex (usually 3D) world. There are also possible "borderline cases" of embodiment, such as a search agent on the Internet. In a sense any AI is embodied, because it occupies some physical system (e.g. computer hardware) and has some way of interfacing with the outside world.
- **Emergence**: A property or pattern in a system is emergent if it arises via the combination of other system components or aspects, in such a way that its details would be very difficult (not necessarily impossible in principle) to predict from these other system components or aspects.
- **Emotion**: Emotions are system-wide responses to the system's current and predicted state. Dorner's Psi theory of emotion contains explanations of many human emotions in terms of underlying dynamics and motivations, and most of these explanations make sense in a CogPrime context, due to CogPrime's use of OpenPsi (modeled on Psi) for motivation and action selection.
- **Episodic Knowledge**: Knowledge about episodes in an agent's life-history, or the life-history of other agents. CogPrime includes a special dimensional embedding space only for episodic knowledge, easing organization and recall.
- **Evolutionary Learning**: Learning that proceeds via the rough process of iterated differential reproduction based on fitness, incorporating variations of reproduced entities. MOSES is an explicitly evolutionary-learning-based portion of CogPrime; but CogPrime's dynamics as a whole may also be conceived as evolutionary.
- **Exemplar**: (in the context of imitation learning) - When the owner wants to teach an OpenCog controlled agent a behavior by imitation, he/she gives the pet an exemplar. To teach a virtual pet "fetch" for instance, the owner is going to throw a stick, run to it, grab it with his/her mouth and come back to its initial position.
- **Exemplar**: (in the context of MOSES) – Candidate chosen as the core of a new deme, or as the central program within a deme, to be varied by representation building for ongoing exploration of program space.
- **Explicit Knowledge Representation**: Knowledge representation in which individual, easily humanly identifiable pieces of knowledge correspond to individual elements in a knowledge store (elements that are explicitly there in the software and accessible via very rapid, deterministic operations)
- **Extension**: In PLN, the extension of a node refers to the instances of the category that the node represents. In contrast is the intension.
- **Fishgram (Frequent and Interesting Sub-hypergraph Mining)**: A pattern mining algorithm for identifying frequent and/or interesting sub-hypergraphs in the Atomspace.
- **First-Order Inference (FOI)**: The subset of PLN that handles Logical Links not involving VariableAtoms or higher-order functions. The other aspect of PLN, Higher-Order Inference, uses Truth Value formulas derived from First-Order Inference.

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- **Forgetting**: The process of removing Atoms from the in-RAM portion of Atomspace, when RAM gets short and they are judged not as valuable to retain in RAM as other Atoms. This is commonly done using the LTI values of the Atoms (removing lowest LTI-Atoms, or more complex strategies involving the LTI of groups of interconnected Atoms). May be done by a dedicated Forgetting MindAgent. VLTI may be used to determine the fate of forgotten Atoms.
- **Forward Chainer**: A control mechanism (MindAgent) for PLN inference, that works by taking existing Atoms and deriving conclusions from them using PLN rules, and then iterating this process. The goal is to derive new Atoms that are interesting according to some given criterion.
- **Frame2Atom**: A simple system of hand-coded rules for translating the output of RelEx2Frame (logical representation of semantic relationships using FrameNet relationships) into Atoms.
- **Freezing**: Saving Atoms from the in-RAM Atomspace to disk.
- **General Intelligence**: Often used in an informal, commonsensical sense, to mean the ability to learn and generalize beyond specific problems or contexts. Has been formalized in various ways as well, including formalizations of the notion of "achieving complex goals in complex environments" and "achieving complex goals in complex environments using limited resources." Usually interpreted as a fuzzy concept, according to which absolutely general intelligence is physically unachievable, and humans have a significant level of general intelligence, but far from the maximally physically achievable degree.
- **Generalized Hypergraph**: A hypergraph with some additional features, such as links that point to links, and nodes that are seen as "containing" whole sub-hypergraphs. This is the most natural and direct way to mathematically/visually model the Atomspace.
- **Generator**: In the PLN design, a rule is denoted a generator if it can produce its consequent without needing premises (e.g. LookupRule, which just looks it up in the AtomSpace). See composer.
- **Global, Distributed Memory**: Memory that stores items as implicit knowledge, with each memory item spread across multiple components, stored as a pattern of organization or activity among them.
- **Glocal Memory**: The storage of items in memory in a way that involves both localized and global, distributed aspects.
- **Goal**: An Atom representing a function that a system (like OpenCog) is supposed to spend a certain non-trivial percentage of its attention optimizing. The goal, informally speaking, is to maximize the Atom's truth value.
- **Goal, Implicit**: A goal that an intelligent system, in practice, strives to achieve; but that is not explicitly represented as a goal in the system's knowledge base.
- **Goal, Explicit**: A goal that an intelligent system explicitly represents in its knowledge base, and expends some resources trying to achieve. Goal Nodes (which may be Nodes or, e.g. ImplicationLinks) are used for this purpose in OpenCog.
- **Goal-Driven Learning**: Learning that is driven by the cognitive schematic i.e. by the quest of figuring out which procedures can be expected to achieve a certain goal in a certain sort of context.
- **Grounded SchemaNode**: See SchemaNode, Grounded.
- **Hebbian Learning**: An aspect of Attention Allocation, centered on creating and updating HebbianLinks, which represent the simultaneous importance of the Atoms joined by the HebbianLink.

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- **Hebbian Links**: Links recording information about the associative relationship (co-occurrence) between Atoms. These include symmetric and asymmetric HebbianLinks.
- **Heterarchical Network**: A network of linked elements in which the semantic relationships associated with the links are generally symmetrical (e.g. they may be similarity links, or symmetrical associative links). This is one important sort of subnetwork of an intelligent system; see Dual Network.
- **Hierarchical Network**: A network of linked elements in which the semantic relationships associated with the links are generally asymmetrical, and the parent nodes of a node have a more general scope and some measure of control over their children (though there may be important feedback dynamics too). This is one important sort of subnetwork of an intelligent system; see Dual Network.
- **Higher-Order Inference (HOI)**: PLN inference involving variables or higher-order functions. In contrast to First-Order Inference (FOI).
- **Hillclimbing**: A general term for greedy, local optimization techniques, including some relatively sophisticated ones that involve "mildly nonlocal" jumps.
- **Human-Level Intelligence**: General intelligence that's "as smart as" human general intelligence, even if in some respects quite unlike human intelligence. An informal concept, which generally doesn't come up much in CogPrime work, but is used frequently by some other AI theorists.
- **Human-Like Intelligence**: General intelligence with properties and capabilities broadly resembling those of humans, but not necessarily precisely imitating human beings.
- **Hypergraph**: A conventional hypergraph is a collection of nodes and links, where each link may span any number of nodes. OpenCog makes use of generalized hypergraphs (the Atomspace is one of these).
- **Imitation Learning**: Learning via copying what some other agent is observed to do.
- **Implication**: Often refers to an ImplicationLink between two PredicateNodes, indicating an (extensional, intensional or mixed) logical implication.
- **Implicit Knowledge Representation**: Representation of knowledge via having easily humanly identifiable pieces of knowledge correspond to the pattern of organization and/or dynamics of elements, rather than via having individual elements correspond to easily humanly identifiable pieces of knowledge.
- **Importance**: A generic term for the Attention Values associated with Atoms. Most commonly these are STI (short term importance) and LTI (long term importance) values. Other importance values corresponding to various different time scales are also possible. In general an importance value reflects an estimate of the likelihood an Atom will be useful to the system over some particular future time-horizon. STI is generally relevant to processor time allocation, whereas LTI is generally relevant to memory allocation.
- **Importance Decay**: The process of Atom importance values (e.g. STI and LTI) decreasing over time, if the Atoms are not utilized. Importance decay rates may in general be context-dependent.
- **Importance Spreading**: A synonym for Importance Updating, intended to highlight the similarity with "activation spreading" in neural and semantic networks.
- **Importance Updating**: The CIM-Dynamic that periodically (frequently) updates the STI and LTI values of Atoms based on their recent activity and their relationships.
- **Imprecise Truth Value**: Peter Walley's imprecise truth values are intervals [L,U], interpreted as lower and upper bounds of the means of probability distributions in an envelope

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of distributions. In general, the term may be used to refer to any truth value involving intervals or related constructs, such as indefinite probabilities.

- **Indefinite Probability**: An extension of a standard imprecise probability, comprising a credible interval for the means of probability distributions governed by a given second-order distribution.
- **Indefinite Truth Value**: An OpenCog TruthValue object wrapping up an indefinite probability
- **Induction**: In PLN, a specific inference rule (A → B, A → C, therefore B → C). In general, the process of heuristically inferring that what has been seen in multiple examples, will be seen again in new examples. Induction in the broad sense, may be carried out in OpenCog by methods other than PLN induction. When emphasis needs to be laid on the particular PLN inference rule, the phrase "PLN Induction" is used.
- **Inference**: Generally speaking, the process of deriving conclusions from assumptions. In an OpenCog context, this often refers to the PLN inference system. Inference in the broad sense is distinguished from general learning via some specific characteristics, such as the intrinsically incremental nature of inference: it proceeds step by step.
- **Inference Control**: A cognitive process that determines what logical inference rule (e.g. what PLN rule) is applied to what data, at each point in the dynamic operation of an inference process.
- **Integrative AGI**: An AGI architecture, like CogPrime, that relies on a number of different powerful, reasonably general algorithms all cooperating together. This is different from an AGI architecture that is centered on a single algorithm, and also different than an AGI architecture that expects intelligent behavior to emerge from the collective interoperation of a number of simple elements (without any sophisticated algorithms coordinating their overall behavior).
- **Integrative Cognitive Architecture**: A cognitive architecture intended to support integrative AGI.
- **Intelligence**: An informal, natural language concept. "General intelligence" is one slightly more precise specification of a related concept; "Universal intelligence" is a fully precise specification of a related concept. Other specifications of related concepts made in the particular context of CogPrime research are the pragmatic general intelligence and the efficient pragmatic general intelligence.
- **Intension**: In PLN, the intention of a node consists of Atoms representing properties of the entity the node represents.
- **Intentional memory**: A system's knowledge of its goals and their subgoals, and associations between these goals and procedures and contexts (e.g. cognitive schematics).
- **Internal Simulation World**: A simulation engine used to simulate an external environment (which may be physical or virtual), used by an AGI system as its "mind's eye" in order to experiment with various action' q sequences and envision their consequences, or observe the consequences of various hypothetical situations. Particularly important for dealing with episodic knowledge.
- **Interval Algebra**: Allen Interval Algebra, a mathematical theory of the relationships between time intervals. CogPrime utilizes a fuzzified version of classic Interval Algebra.
- **IRC Learning (Imitation, Reinforcement, Correction)**: Learning via interaction with a teacher, involving a combination of imitating the teacher, getting explicit reinforcement signals from the teacher, and having one's incorrect or suboptimal behaviors guided toward betterness by the teacher in real-time. This is a large part of how young humans learn.

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- **Knowledge Base**: A shorthand for the totality of knowledge possessed by an intelligent system during a certain interval of time (whether or not this knowledge is explicitly represented). Put differently: this is an intelligence's total memory contents (inclusive of all types of memory) during an interval of time.
- **Language Comprehension**: The process of mapping natural language speech or text into a more "cognitive", largely language-independent representation. In OpenCog this has been done by various pipelines consisting of dedicated natural language processing tools, e.g. a pipeline: text → Link Parser → RelEx → RelEx2Frame → Frame2Atom Atomspace; and alternatively a pipeline Link Parser → Link2Atom → Atomspace. It would also be possible to do language comprehension purely via PLN and other generic OpenCog processes, without using specialized language processing tools.
- **Language Generation**: The process of mapping (largely language-independent) cognitive content into speech or text. In OpenCog this has been done by various pipelines consisting of dedicated natural language processing tools, e.g. a pipeline: Atomspace → NLGen → text; or more recently Atomspace → Atom2Link → surface realization → text. It would also be possible to do language generation purely via PLN and other generic OpenCog processes, without using specialized language processing tools.
- **Language Processing**: Processing of human language is decomposed, in CogPrime, into Language Comprehension, Language Generation, and Dialogue Control.
- **Learning**: In general, the process of a system adapting based on experience, in a way that increases its intelligence (its ability to achieve its goals). The theory underlying CogPrime doesn't distinguish learning from reasoning, associating, or other aspects of intelligence.
- **Learning Server**: In some OpenCog configurations, this refers to a software server that performs "offline" learning tasks (e.g. using MOSES or hillclimbing), and is in communication with an Operational Agent Controller software server that performs real-time agent control and dispatches learning tasks to and receives results from the Learning Server.
- **Linguistic Links**: A catch-all term for Atoms explicitly representing linguistic content, e.g. WordNode, SentenceNode, CharacterNode.
- **Link**: A type of Atom, representing a relationship among one or more Atoms. Links and Nodes are the two basic kinds of Atoms.
- **Link Parser**: A natural language syntax parser, created by Sleator and Temperley at Carnegie-Mellon University, and currently used as part of OpenCogPrime's natural language comprehension and natural language generation system.
- **Link2Atom**: A system for translating link parser links into Atoms. It attempts to resolve precisely as much ambiguity as needed in order to translate a given assemblage of link parser links into a unique Atom structure.
- **Lobe**: A term sometimes used to refer to a portion of a distributed Atomspace that lives in a single computational process. Often different lobes will live on different machines.
- **Localized Memory**: Memory that stores each item using a small number of closely-connected elements.
- **Logic**: In an OpenCog context, this usually refers to a set of formal rules for translating certain combinations of Atoms into "conclusion" Atoms. The paradigm case at present is the PLN probabilistic logic system, but OpenCog can also be used together with other logics.
- **Logical Links**: Any Atoms whose truth values are primarily determined or adjusted via logical rules, e.g. PLN's InheritanceLink, SimilarityLink, ImplicationLink, etc. The term isn't usually applied to other links like HebbianLinks whose semantics isn't primarily logic-

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based, even though these other links can be processed via (e.g. PLN) logical inference via interpreting them logically.

- **Lojban**: A constructed human language, with a completely formalized syntax and a highly formalized semantics, and a small but active community of speakers. In principle this seems an extremely good method for communication between humans and early-stage AGI systems.
- **Lojban++**: A variant of Lojban that incorporates English words, enabling more flexible expression without the need for frequent invention of new Lojban words.
- **Long Term Importance (LTI)**: A value associated with each Atom, indicating roughly the expected utility to the system of keeping that Atom in RAM rather than saving it to disk or deleting it. It's possible to have multiple LTI values pertaining to different time scales, but so far practical implementation and most theory has centered on the option of a single LTI value.
- **LTI**: Long Term Importance
- **Map**: A collection of Atoms that are interconnected in such a way that they tend to be commonly active (i.e. to have high STI, e.g. enough to be in the AttentionalFocus, at the same time).
- **Map Encapsulation**: The process of automatically identifying maps in the Atomspace, and creating Atoms that "encapsulate" them; the Atom encapsulation a map would link to all the Atoms in the map. This is a way of making global memory into local memory, thus making the system's memory glocal and explicitly manifesting the "cognitive equation." This may be carried out via a dedicated MapEncapsulation MindAgent.
- **Map Formation**: The process via which maps form in the Atomspace. This need not be explicit; maps may form implicitly via the action of Hebbian Learning. It will commonly occur that Atoms frequently co-occurring in the AttentionalFocus, will come to be joined together in a map.
- **Memory Types**: In CogPrime
  this generally refers to the different types of memory that are embodied in different data structures or processes in the CogPrime
  architecture, e.g. declarative (semantic), procedural, attentional, intentional, episodic, sensorimotor.
- **Mind-World Correspondence Principle**: The principle that, for a mind to display efficient pragmatic general intelligence relative to a world, it should display many of the same key structural properties as that world. This can be formalized by modeling the world and mind as probabilistic state transition graphs, and saying that the categories implicit in the state transition graphs of the mind and world should be inter-mappable via a high-probability morphism.
- **Mind OS**: A synonym for the OpenCog Core.
- **MindAgent**: An OpenCog software object, residing in the CogServer, that carries out some processes in interaction with the Atomspace. A given conceptual cognitive process (e.g. PLN inference, Attention allocation, etc.) may be carried out by a number of different MindAgents designed to work together.
- **Mindspace**: A model of the set of states of an intelligent system as a geometrical space, imposed by assuming some metric on the set of mind-states. This may be used as a tool for formulating general principles about the dynamics of generally intelligent systems.
- **Modulators**: Parameters in the Psi model of motivated, emotional cognition, that modulate the way a system perceives, reasons about and interacts with the world.

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- **MOSES (Meta-Optimizing Semantic Evolutionary Search)**: An algorithm for procedure learning, which in the current implementation learns programs in the Combo language. MOSES is an evolutionary learning system, which differs from typical genetic programming systems in multiple aspects including: a subtler framework for managing multiple "demes" or "islands" of candidate programs; a library called Reduct for placing programs in Elegant Normal Form; and the use of probabilistic modeling in place of, or in addition to, mutation and crossover as means of determining which new candidate programs to try.
- **Motoric**: Pertaining to the control of physical actuators, e.g. those connected to a robot. May sometimes be used to refer to the control of movements of a virtual character as well.
- **Moving Bubble of Attention**: The Attentional Focus of a CogPrime system.
- **Natural Language Comprehension**: See Language Comprehension
- **Natural Language Generation**: See Language Generation
- **Natural Language Processing (NLP)**: See Language Processing
- **NLGen**: Software for carrying out the surface realization phase of natural language generation, via translating collections of RelEx output relationships into English sentences. Was made functional for simple sentences and some complex sentences; not currently under active development, as work has shifted to the related Atom2Link approach to language generation.
- **Node**: A type of Atom. Links and Nodes are the two basic kinds of Atoms. Nodes, mathematically, can be thought of as "0-ary" links. Some types of Nodes refer to external or mathematical entities (e.g. WordNode, NumberNode); others are purely abstract, e.g. a ConceptNode is characterized purely by the Links relating it to other atoms. GroundedPredicateNodes and GroundedSchemaNodes connect to explicitly represented procedures (sometimes in the Combo language); ungrounded PredicateNodes and SchemaNodes are abstract and, like ConceptNodes, purely characterized by their relationships.
- **Node Probability**: Many PLN inference rules rely on probabilities associated with Nodes. Node probabilities are often easiest to interpret in a specific context, e.g. the probability P(cat) makes obvious sense in the context of a typical American house, or in the context of the center of the sun. Without any contextual specification, P(A) is taken to mean the probability that a randomly chosen occasion of the system's experience includes some instance of A.
- **Novamente Cognition Engine (NCE)**: A proprietary proto-AGI software system, the predecessor to OpenCog. Many parts of the NCE were open-sourced to form portions of OpenCog, but some NCE code was not included in OpenCog; and now OpenCog includes multiple aspects and plenty of code that was not in NCE.
- **OpenCog**: A software framework intended for development of AGI systems, and also for narrow-AI application using tools that have AGI applications. Co-designed with the CogPrime cognitive architecture, but not exclusively bound to it.
- **OpenCog Prime (OCP)**: The implementation of the CogPrime cognitive architecture within the OpenCog software framework.
- **OpenPsi**: CogPrime's architecture for motivation-driven action selection, which is based on adapting Dorner's Psi model for use in the OpenCog framework.
- **Operational Agent Controller (OAC)**: In some OpenCog configurations, this is a software server containing a CogServer devoted to real-time control of an agent (e.g. a virtual world agent, or a robot). Background, offline learning tasks may then be dispatched to other software processes, e.g. to a Learning Server.

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- **Pattern**: In a CogPrime context, the term "pattern" is generally used to refer to a process that produces some entity, and is judged simpler than that entity.
- **Pattern Mining**: Pattern mining is the process of extracting an (often large) number of patterns from some body of information, subject to some criterion regarding which patterns are of interest. Often (but not exclusively) it refers to algorithms that are rapid or "greedy", finding a large number of simple patterns relatively inexpensively.
- **Pattern Recognition**: The process of identifying and representing a pattern in some substrate (e.g. some collection of Atoms, or some raw perceptual data, etc.).
- **Patternism**: The philosophical principle holding that, from the perspective of engineering intelligent systems, it is sufficient and useful to think about mental processes in terms of (static and dynamical) patterns.
- **Perception**: The process of understanding data from sensors. When natural language is ingested in textual format, this is generally not considered perceptual. Perception may be taken to encompass both pre-processing that prepares sensory data for ingestion into the Atomspace, processing via specialized perception processing systems like DeSTIN that are connected to the Atomspace, and more cognitive-level process within the Atomspace that is oriented toward understanding what has been sensed.
- **Piagetan Stages**: A series of stages of cognitive development hypothesized by developmental psychologist Jean Piaget, which are easy to interpret in the context of developing CogPrime systems. The basic stages are: Infantile, Pre-operational, Concrete Operational and Formal. Post-formal stages have been discussed by theorists since Piaget and seem relevant to AGI, especially advanced AGI systems capable of strong self-modification.
- **PLN**: short for Probabilistic Logic Networks
- **PLN, First-Order**: See First-Order Inference
- **PLN, Higher-Order**: See Higher-Order Inference
- **PLN Rules**: A PLN Rule takes as input one or more Atoms (the "premises", usually Links), and output an Atom that is a "logical conclusion" of those Atoms. The truth value of the consequence is determined by a PLN Formula associated with the Rule.
- **PLN Formulas**: A PLN Formula, corresponding to a PLN Rule, takes the TruthValues corresponding to the premises and produces the TruthValue corresponding to the conclusion. A single Rule may correspond to multiple Formulas, where each Formula deals with a different sort of TruthValue.
- **Pragmatic General Intelligence**: A formalization of the concept of general intelligence, based on the concept that general intelligence is the capability to achieve goals in environments, calculated as a weighted average over some fuzzy set of goals and environments.
- **Predicate Evaluation**: The process of determining the Truth Value of a predicate, embodied in a PredicateNode. This may be recursive, as the predicate referenced internally by a Grounded PredicateNode (and represented via a Combo program tree) may itself internally reference other PredicateNodes.
- **Probabilistic Logic Networks (PLN)**: A mathematical and conceptual framework for reasoning under uncertainty, integrating aspects of predicate and term logic with extensions of imprecise probability theory. OpenCogPrime's central tool for symbolic reasoning.
- **Procedural Knowledge**: Knowledge regarding which series of actions (or action-combinations) are useful for an agent to undertake in which circumstances. In CogPrime these may be learned in a number of ways, e.g. via PLN or via Hebbian learning of Schema Maps, or via explicit learning of Combo programs via MOSES or hillclimbing. Procedures are represented as SchemaNodes or Schema Maps.

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- **Procedure Evaluation/Execution**: A general term encompassing both Schema Execution and Predicate Evaluation, both of which are similar computational processes involving manipulation of Combo trees associated with ProcedureNodes.
- **Procedure Learning**: Learning of procedural knowledge, based on any method, e.g. evolutionary learning (e.g. MOSES), inference (e.g. PLN), reinforcement learning (e.g. Hebbian learning).
- **Procedure Node**: A SchemaNode or PredicateNode
- **Psi**: A model of motivated action and emotion, originated by Dietrich Dorner and further developed by Joscha Bach, who incorporated it in his proto-AGI system MicroPsi. OpenCog-Prime's motivated-action component, OpenPsi, is roughly based on the Psi model.
- **Psynese**: A system enabling different OpenCog instances to communicate without using natural language, via directly exchanging Atom subgraphs, using a special system to map references in the speaker's mind into matching references in the listener's mind.
- **Psynet Model**: An early version of the theory of mind underlying CogPrime, referred to in some early writings on the Webmind AI Engine and Novamente Cognition Engine. The concepts underlying the psynet model are still part of the theory underlying CogPrime, but the name has been deprecated as it never really caught on.
- **Reasoning**: See inference
- **Reduct**: A code library, used within MOSES, applying a collection of hand-coded rewrite rules that transform Combo programs into Elegant Normal Form.
- **Region Connection Calculus**: A mathematical formalism describing a system of basic operations among spatial regions. Used in CogPrime as part of spatial inference to provide relations and rules to be referenced via PLN and potentially other subsystems.
- **Reinforcement Learning**: Learning procedures via experience, in a manner explicitly guided to cause the learning of procedures that will maximize the system's expected future reward. CogPrime does this implicitly whenever it tries to learn procedures that will maximize some Goal whose Truth Value is estimated via an expected reward calculation (where "reward" may mean simply the Truth Value of some Atom defined as "reward"). Goal-driven learning is more general than reinforcement learning as thus defined; and the learning that CogPrime does, which is only partially goal-driven, is yet more general.
- **RelEx**: A software system used in OpenCog as part of natural language comprehension, to map the output of the link parser into more abstract semantic relationships. These more abstract relationships may then be entered directly into the Atomspace, or they may be further abstracted before being entered into the Atomspace, e.g. by RelEx2Frame rules.
- **RelEx2Frame**: A system of rules for translating RelEx output into Atoms, based on the FrameNet ontology. The output of the RelEx2Frame rules make use of the FrameNet library of semantic relationships. The current (2012) RelEx2Frame rule-based is problematic and the RelEx2Frame system is deprecated as a result, in favor of Link2Atom. However, the ideas embodied in these rules may be useful; if cleaned up the rules might profitably be ported into the Atomspace as ImplicationLinks.
- **Representation Building**: A stage within MOSES, wherein a candidate Combo program tree (within a deme) is modified by replacing one or more tree nodes with alternative tree nodes, thus obtaining a new, different candidate program within that deme. This process currently relies on hand-coded knowledge regarding which types of tree nodes a given tree node should be experimentally replaced with (e.g. an AND node might sensibly be replaced with an OR node, but not so sensibly replaced with a node representing a "kick" action).

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- **Request for Services (RFS)**: In CogPrime's Goal-driven action system, a RFS is a package sent from a Goal Atom to another Atom, offering it a certain amount of STI currency if it is able to deliver the goal what it wants (an increase in its Truth Value). RFS's may be passed on, e.g. from goals to subgoals to sub-subgoals, but eventually an RFS reaches a Grounded SchemaNode, and when the corresponding Schema is executed, the payment implicit in the RFS is made.
- **Robot Preschool**: An AGI Preschool in our physical world, intended for robotically embodied AGIs.
- **Robotic Embodiment**: Using an AGI to control a robot. The AGI may be running on hardware physically contained in the robot, or may run elsewhere and control the robot via networking methods such as wifi.
- **Scheduler**: Part of the CogServer that controls which processes (e.g. which MindAgents) get processor time, at which point in time.
- **Schema**: A "script" describing a process to be carried out. This may be explicit, as in the case of a GroundedSchemaNode, or implicit, as the case in Schema maps or ungrounded SchemaNodes.
- **Schema Encapsulation**: The process of automatically recognizing a Schema Map in an Atomspace, and creating a Combo (or other) program embodying the process carried out by this Schema Map, and then storing this program in the Procedure Repository and associating it with a particular SchemaNode. This translates distributed, global procedural memory into localized procedural memory. It's a special case of Map Encapsulation.
- **Schema Execution**: The process of "running" a Grounded Schema, similar to running a computer program. Or, phrased alternately: The process of executing the Schema referenced by a Grounded SchemaNode. This may be recursive, as the predicate referenced internally by a Grounded SchemaNode (and represented via a Combo program tree) may itself internally reference other Grounded SchemaNodes.
- **Schema, Grounded**: A Schema that is associated with a specific executable program (either a Combo program or, say, C++ code)
- **Schema Map**: A collection of Atoms, including SchemaNodes, that tend to be enacted in a certain order (or set of orders), thus habitually enacting the same process. This is a distributed, globalized way of storing and enacting procedures.
- **Schema, Ungrounded**: A Schema that represents an abstract procedure, not associated with any particular executable program.
- **Schematic Implication**: A general, conceptual name for implications of the form ((Context AND Procedure) IMPLIES Goal)
- **SegSim**: A name for the main algorithm underlying the NLGen language generation software. The algorithm is based on segmenting a collection of Atoms into small parts, and matching each part against memory to find, for each part, cases where similar Atom-collections already have known linguistic expression.
- **Self-Modification**: A term generally used for AI systems that can purposefully modify their core algorithms and representations. Formally and crisply distinguishing this sort of "strong self-modification" from "mere" learning is a tricky matter.
- **Sensorimotor**: Pertaining to sensory data, motoric actions, and their combination and intersection.
- **Sensory**: Pertaining to data received by the AGI system from the outside world. In a CogPrime system that perceives language directly as text, the textual input will generally

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not be considered as "sensory" (on the other hand, speech audio data would be considered as "sensory").

- **Short Term Importance**: A value associated with each Atom, indicating roughly the expected utility to the system of keeping that Atom in RAM rather than saving it to disk or deleting it. It's possible to have multple LTI values pertaining to different time scales, but so far practical implementation and most theory has centered on the option of a single LTI value.
- **Similarity**: a link type indicating the probabilistic similarity between two different Atoms. Generically this is a combination of Intensional Similarity (similarity of properties) and Extensional Similarity (similarity of members).
- **Simple Truth Value**: a TruthValue involving a pair (s,d) indicating strength (e.g. probability or fuzzy set membership) and confidence d. d may be replaced by other options such as a count n or a weight of evidence w.
- **Simulation World**: See Internal Simulation World
- **SMEPH (Self-Modifying Evolving Probabilistic Hypergraphs)**: a style of modeling systems, in which each system is associated with a derived hypergraph
- **SMEPH Edge**: A link in a SMEPH derived hypergraph, indicating an empirically observed relationship (e.g. inheritance or similarity) between two
- **SMEPH Vertex**: A node in a SMEPH derived hypergraph representing a system, indicating a collection of system states empirically observed to arise in conjunction with the same external stimuli
- **Spatial Inference**: PLN reasoning including Atoms that explicitly reference spatial relationships
- **Spatiotemporal Inference**: PLN reasoning including Atoms that explicitly reference spatial and temporal relationships
- **STI**: Shorthand for Short Term Importance
- **Strength**: The main component of a TruthValue object, lying in the interval [0,1], referring either to a probability (in cases like InheritanceLink, SimilarityLink, EquivalenceLink, ImplicationLink, etc.) or a fuzzy value (as in MemberLink, EvaluationLink).
- **Strong Self-Modification**: This is generally used as synonymous with Self-Modification, in a CogPrime context.
- **Subsymbolic**: Involving processing of data using elements that have no correspondence to natural language terms, nor abstract concepts; and that are not naturally interpreted as symbolically "standing for" other things. Often used to refer to processes such as perception processing or motor control, which are concerned with entities like pixels or commands like "rotate servomotor 15 by 10 degrees theta and 55 degrees phi." The distinction between "symbolic" and "subsymbolic" is conventional in the history of AI, but seems difficult to formalize rigorously. Logic-based AI systems are typically considered "symbolic", yet
- **Supercompilation**: A technique for program optimization, which globally rewrites a program into a usually very different looking program that does the same thing. A prototype supercompiler was applied to Combo programs with successful results.
- **Surface Realization**: The process of taking a collection of Atoms and transforming them into a series of words in a (usually natural) language. A stage in the overall process of language generation.
- **Symbol Grounding**: The mapping of a symbolic term into perceptual or motoric entities that help define the meaning of the symbolic term. For instance, the concept "Cat" may be

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grounded by images of cats, experiences of interactions with cats, imaginations of being a cat, etc.

- **Symbolic**: Pertaining to the formation or manipulation of symbols, i.e. mental entities that are explicitly constructed to represent other entities. Often contrasted with subsymbolic.
- **Syntax-Semantics Correlation**: In the context of MOSES and program learning more broadly, this refers to the property via which distance in syntactic space (distance between the syntactic structure of programs, e.g. if they're represented as program trees) and semantic space (distance between the behaviors of programs, e.g. if they're represented as sets of input/output pairs) are reasonably well correlated. This can often happen among sets of programs that are not too widely dispersed in program space. The Reduct library is used to place Combo programs in Elegant Normal Form, which increases the level of syntax-semantics corellation between them. The programs in a single MOSES deme are often closely enough clustered together that they have reasonably high syntax-semantics correlation.
- **System Activity Table**: An OpenCog component that records information regarding what a system did in the past.
- **Temporal Inference**: Reasoning that heavily involves Atoms representing temporal information, e.g. information about the duration of events, or their temporal relationship (before, after, during, beginning, ending). As implemented in CogPrime, makes use of an uncertain version of Allen Interval Algebra.
- **Truth Value**: A package of information associated with an Atom, indicating its degree of truth. SimpleTruthValue and IndefiniteTruthValue are two common, particular kinds. Multiple truth values associated with the same Atom from different perspectives may be grouped into CompositeTruthValue objects.
- **Universal Intelligence**: A technical term introduced by Shane Legg and Marcus Hutter, describing (roughly speaking) the average capability of a system to carry out computable goals in computable environments, where goal/environment pairs are weighted via the length of the shortest program for computing them.
- **Urge**: In OpenPsi, an Urge develops when a Demand deviates from its target range.
- **Very Long Term Importance (VLTI)**: A bit associated with Atoms, which determines whether, when an Atom is forgotten (removed from RAM), it is saved to disk (frozen) or simply deleted.
- **Virtual AGI Preschool**: A virtual world intended for AGI teaching/training/learning, bearing broad resemblance to the preschool environments used for young humans.
- **Virtual Embodiment**: Using an AGI to control an agent living in a virtual world or game world, typically (but not necessarily) a 3D world with broad similarity to the everyday human world.
- **Webmind AI Engine**: A predecessor to the Novamente Cognition Engine and OpenCog, developed 1997-2001 – with many similar concepts (and also some different ones) but quite different algorithms and software architecture

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Clients always want their aircraft to be modern and up-to-date, while maintaining an understated, luxurious aesthetic

In a 50,000-square-foot hangar at Long Island's MacArthur Airport, an aircraft interiors project has its designer "fired on all cylinders". Tasked to modify and refurbish a Global 5000 for the sports entertainment giant, World Wrestling Entertainment (WWE, formerly WWF), New York-based International Jet Interiors is putting a progressive spin on cabin design. While the livery boasts WWE's corporate colours, the interiors use "hand-woven carpets, custom-made metal finishes including a spun black pearl finish, custom-dyed leathers and bespoke seating from Italy", says Eric Roth, the designer at International Jet Interiors' helm.

But the highlight is in the high-tech facilities: studio-grade equipment that enables on-the-fly editing of feeds from live sports entertainment shows, which are transmitted via on-board satellite. Meanwhile, specially programmed iPad minis control the cabin functions. "It will be the ultimate couture craft when completed in January 2014," says Roth.

No stranger to special client requests, Roth says he loves the challenge — the more unusual the request, the more he and his team seem to excel in delivering the solution. His clients come from around the world with a varied wish-list, ranging from entertainment systems with satellite TV and high-speed WiFi to 24-karat gold-plated fixtures throughout the craft. >>

THE MORE UNUSUAL THE REQUEST, THE MORE ROTH AND HIS TEAM SEEM TO EXCEL IN DELIVERING THE SOLUTION

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"HELPING CLIENTS STRATEGISE IS A KEY PART OF THE DESIGN PROCESS. I LOOK AT HOW LONG THEY HAVE OWNED THE CRAFT AND AT ITS DEPRECIATING ASSET VALUE"

HOUSE_OVERSIGHT_013271

Details set Roth's work apart from other aircraft interiors — from the choice of lighting, carpet, upholstery and cabinetry, to gadget stowage and dining accessories

>> Its refurbishment of Donald Trump's Boeing 757, for instance, included a 24-karat gold-plated bathroom sink. Other projects have required reconfiguring the seating layout to make kennel space for hunting dogs, installing ultra-secure bassinets for newborn infants, and wrapping a toilet seat in crocodile skin for a client in India.

Roth says that as a designer and design director, his main task is to develop an intimate understanding of a client's lifestyle and his use of the jet — the percentage of time spent for business, pleasure, corporate entertainment and family time. "Helping clients strategise is a key part of the design process. I look at how long they have owned the craft and at its depreciating asset value, and work out if it's worth it to invest in the latest piece of technology or ultra comfort accessory. Most of them will opt for the investment because they want their aircraft to be up-to-date, even if this does not up its asset value."

At times, thorough strategising is needed even before International Jet Interiors accepts a project. A US-based film producer once wanted a 'sky studio' so that he and his four-member team could edit films onboard his Gulfstream. This required state-of-the-art editing equipment, surround sound, and a 42-inch, flat-screen, high-definition TV. "The client perceived the theatre >>

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>> aspect as the great challenge — yet it was balancing the weight of the floor-plan change and equipment furnishing that was the real challenge. The structural and technical analysis consumed the better part of three weeks before we could make the commitment to produce this unique aircraft," says Roth.

Despite many quirky refurbishing requests, Roth says a fair percentage of his clients avoid using their aircraft to make a statement: "They will come to me saying 'Eric, I want it to be luxuriously comfortable, very functional but extremely understated'." Nearly 75 per cent of the firm's clients are US-based, but it is now receiving more requests from private-jet owners in Asia. The company has worked with clients in Shanghai, Tokyo and Mumbai, and is in discussions with new customers in Africa.

He hopes to one day produce a "green and sustainable" solution for a client. That may sound like an oxymoron, and it will take a designer used to pushing the limits of convention to create such a ground-breaking design. It looks like Roth is cut out for the job.

"CLIENTS COME TO ME SAYING 'ERIC, I WANT IT TO BE LUXURIOUSLY COMFORTABLE, VERY FUNCTIONAL BUT EXTREMELY UNDERSTATED'."

OPPOSITE

International Jet Interiors achieves a sleek, streamlined appeal by modifying an aircraft's window line and periphery, and using composite materials exclusively

THIS PAGE

Hand-stitched leathers and finely woven fabrics create a luxurious, comfortable ambiance

Gadgets can be configured to control the lightings in the cabin interior

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Bloomberg

Thatcher, Mandela, Chavez Are Among Notable Deaths in 2013

2013-12-26 05:01:00.3 GMT

By Steven Gittelson

Dec. 26 (Bloomberg) -- The first female prime minister of the U.K., the first black president of South Africa and the first woman to buy a seat on the New York Stock Exchange were among the notable deaths of 2013.

Margaret Thatcher, 87, died in April; Nelson Mandela, 95, died this month; and Muriel Siebert, 84, died in August.

The year also included the deaths of politicians Edward Koch, 88, in February and Hugo Chavez, 58, in March; musicians Marian McPartland, 95, in August and Lou Reed, 71, in October; and athletes Stan Musial, 92, in January, and Ken Norton, 70, in September.

The world of business, finance and investing lost Fred Turner, 80, the former McDonald's Corp. chief executive officer who introduced Chicken McNuggets, Egg McMuffins and Happy Meals,
in January; Martin Zweig, 70, who predicted the 1987 stock-market crash, in February; and Alfred Feld, 98, whose 80 years at Goldman Sachs Group Inc. made him the firm's longest-serving employee, in November.

Here are the year's notable deaths, with each name linked to a previously published obituary. A cause of death is provided when known.

January

Patti Page, 85. U.S. pop singer whose 1950s hits included "Tennessee Waltz" and "(How Much Is That) Doggie in the Window?" Died Jan. 1.

Lewis Adam, 68. He was a fuel trader who became president of ADMO Energy LLC, a supply consultant in Kansas City, Missouri.

Died Jan. 2 of a heart attack on his first day of retirement.

Fred Turner, 80. As CEO at McDonald's Corp., now the world's largest restaurant company, he introduced Chicken McNuggets, the Egg McMuffin and Happy Meals. Died Jan. 7 of complications from pneumonia.

Ada Louise Huxtable, 91. She became the first full-time architecture critic at a U.S. newspaper when she was hired by the New York Times in 1963 and won the first Pulitzer Prize for distinguished criticism, in 1970. Died Jan. 7.

James M. Buchanan, 93. The U.S. economist who won the 1986 Nobel
Prize for applying the tools of economics to analyze political decision-making. Died Jan. 9.

Daniel J. Edelman, 92. He founded Chicago-based Daniel J. Edelman Inc., now the world's largest independent public-relations company, and helped pioneer the use of celebrities in PR campaigns. Died Jan. 15 of heart failure.

Thomas Candillier, 37. The Paris-based head of European equity sales at JPMorgan Chase & Co., who joined the bank in 2001 after working in energy derivative sales at Goldman Sachs. Died Jan. 16.

Robert Citron, 87. He was the treasurer of Orange County, California, in 1994, when his bad bets on derivative securities lost about $1.7 billion, causing what was then the biggest U.S. municipal bankruptcy. Died Jan. 16.

Pauline Phillips, 94. To millions of U.S. newspaper readers, she was Abigail Van Buren, author of the personal advice column, "Dear Abby." Died Jan. 16 from Alzheimer's disease.

Stan Musial, 92. A Hall of Fame outfielder for Major League Baseball's St. Louis Cardinals, "Stan the Man" was one of the game's great hitters during the 1940s and 1950s. Died Jan. 19.

Earl Weaver, 82. He was the hot-tempered manager of the Baltimore Orioles baseball team for 17 years, guiding his club to the World Series four times and winning the championship in 1970. Died Jan. 19 of a heart attack.

Michael Winner, 77. The British film director best known for making the first three “Death Wish” action movies, starring Charles Bronson. Died Jan. 21 of liver cancer.

A.W. “Tom” Clausen, 89. He rose from part-time cash counter to CEO at Bank of America Corp., and returned for a second stint as chief after serving as World Bank president. Died Jan. 21 of complications from pneumonia.

Maria Schaumayer, 82. The Austrian economist who in 1990 became the first woman to lead a European central bank. Died Jan. 23.

John M. “Jack” McCarthy, 85. The stock-market optimist who from 1983 to 1992 was co-managing partner at Lord Abbett & Co., an investment management firm, in Jersey City, New Jersey. Died Jan. 23.

Barry Lind, 74. Founder of Lind-Waldock & Co., a discount futures firm in Chicago, who helped transform the Chicago Mercantile Exchange into a market for financial futures. Died Jan. 24, one day after he was struck by a car.

Ben Steele, 35. He joined London-based hedge fund Armajaro Asset Management LLP in 2012 to start a pool trading shares of financial companies. Died Jan. 25 of an apparent heart attack.

Stefan Kudelski, 84. The Polish-born inventor of the first professional-quality portable audio recorder, in 1951. Died Jan. 26 in Switzerland.

Patty Andrews, 94. Last surviving member of the Andrews Sisters trio, the most popular female vocal group of the first half of the 20th century. Died Jan. 30 in Los Angeles.

Caleb Moore, 25. A Texas-born snowmobile racer who became the

sport's first fatality. Died Jan. 31, one week after crashing at the Winter X Games in Aspen, Colorado.

February

Edward I. Koch, 88. As New York mayor from 1978 to 1989, he led the city back from the brink of bankruptcy, turning a $1 billion budget deficit into a $500 million surplus in five years. Died Feb. 1 of heart failure.

Edith Lauterbach, 91. Last survivor of a quintet of U.S. women, who in 1945 founded the Air Line Stewardesses Association, the world's first union for flight attendants. Died Feb. 4.

George Frazer, 86. Chairman of Toronto-based Leon Frazer & Associates, who invested in companies with high dividends during his seven decades as a fund manager. Died Feb. 6.

Rem Vyakhirev, 78. He was CEO of OAO Gazprom, the world's biggest natural-gas producer, from 1993 to 2001. Died Feb. 11.

Stokley Towles, 77. He spent his career at the Boston office of New York-based Brown Brothers Harriman & Co., creating the firm's global custody service, which now accounts for more than 70 percent of the bank's employees. Died Feb. 14.

Mindy McCready, 37. A U.S. country music singer whose hits included "Guys Do It All the Time." Died Feb. 17 of apparent suicide.

Otto Beisheim, 89. German billionaire, who in 1964 co-founded Metro AG, now Germany's biggest retailer. Died Feb. 18 of suicide after suffering from an incurable illness.

Jerry Buss, 80. After buying the Los Angeles Lakers in 1979, he added marquee stars including Magic Johnson and Kobe Bryant, winning 10 National Basketball Association championships between 1980 and 2010. Died Feb. 18 of kidney failure related to cancer treatment.

Martin Zweig, 70. He predicted the 1987 stock-market crash and wrote books and newsletters that influenced U.S. investors for more than a quarter century. Died Feb. 18.

Alger “Duke” Chapman Jr., 81. The CEO of Shearson Hammill & Co., who merged the firm with Sanford Weill’s Hayden Stone Inc. in 1974, a milestone in the emergence of mega-companies within the finance industry. Died Feb. 18 of congestive heart failure in Little Rock, Arkansas, where he retired.

Susan Carroll, 50. A managing director of Morgan Stanley since 2009, who was the chief operating officer of Salt Lake City-based Morgan Stanley Bank. Died Feb. 18 of liver disease.

Paul McIlhenny, 68. He was the fourth generation of his family to lead McIlhenny Co., a maker of Tabasco sauce. Died Feb. 23 of a heart attack at his home in New Orleans.

C. Everett Koop, 96. As U.S. surgeon general from 1981 to 1989, he used his position to educate Americans about the dangers of smoking while pushing the government to take a stronger stand against AIDS. Died Feb. 25.

Stephane Hessel, 95. A hero of the French Resistance and former United Nations diplomat, who in 2010 wrote “Indignez-Vous!,” titled “Time for Outrage” in the U.S., a best-selling pamphlet that helped inspire social protests in Europe and the Occupy Wall Street movement. Died Feb. 26 in Paris.

Robert Elberson, 84. As CEO of Hanes Corp., he introduced L’eggs pantyhose, and became president of Hanes’s parent, Sara Lee Corp. Died Feb. 26 at his home in Charlotte, North Carolina.

Van Cliburn, 78. The pianist from Texas, whose triumph as a 23-year-old at the 1958 Tchaikovsky International Piano and Violin Festival in Moscow made him an international star. Died Feb. 27 of bone cancer.

Bruce Reynolds, 81. Mastermind of the 1963 Great Train Robbery in Britain, which brought him fame, fortune and 10 years in

prison. Died Feb. 28.

March

Bonnie Franklin, 69. The actress best known for playing divorced mother Ann Romano in the U.S. television show “One Day at a Time,” which aired from 1975 to 1984. Died March 1 of pancreatic cancer.

James Strong, 68. Former CEO of Qantas Airways Ltd., Australia’s biggest airline, and former chairman of Woolworths Ltd., the country’s largest retailer. Died March 3 in Sydney of complications from surgery.

Hugo Chavez, 58. President of Venezuela since 1998, who used the country’s oil wealth to help the poor, nationalized corporations and dismissed foes as puppets of U.S. imperialism. Died March 5 of cancer.

John J. Byrne, 80. He led Geico Corp. from 1976 to 1985 and saved the insurer from bankruptcy, leading Warren Buffett to buy the company and call him “the Babe Ruth of insurance.” Died March 7 of prostate cancer.

Michael P. Duffy, 54. As the head of JPMorgan’s Dallas-based Chase Paymentech unit, he helped make the bank one of the largest U.S. processors of credit-card and electronic payments. Died March 7 of cancer.

Ewald-Heinrich von Kleist, 90. Last survivor of a group of German army officers, who tried unsuccessfully to kill Adolf Hitler. Died March 8.

Elizabeth Cheval, 56. She founded EMC Capital Management Inc., a Bannockburn, Illinois-based investment firm. Died March 9 in China after suffering a brain aneurysm during a business trip.

Ieng Sary, 87. Former foreign minister of the Khmer Rouge, who died while on trial for the deaths of 1.7 million Cambodians in the 1970s. Died March 14.

K. Anji Reddy, 74. Billionaire founder of Dr. Reddy's Laboratories Ltd., India's second-largest drugmaker. Died March 15 of liver cancer.

Olivier Metzner, 63. One of France's best-known defense lawyers, whose clients included former Societe Generale SA trader Jerome Kerviel. Died of suicide on March 17, when his body was found floating near his private island in Brittany.

Steve Davis, 60. Quarterback on the University of Oklahoma's national college football championship teams in 1974 and 1975. Died March 17 in a plane crash.

Harry Reems, 65. The male star of "Deep Throat," a 1972 U.S. film that brought hardcore pornography to mainstream audiences. Died March 19 in Salt Lake City.

Rise Stevens, 99. New York City-born mezzo-soprano who starred at the Metropolitan Opera in the 1940s and 1950s and was best known for playing the lead role in "Carmen." Died March 20.

Chinua Achebe, 82. The Nigerian author of "Things Fall Apart" (1958), one of the first novels by an African writer to attract a worldwide audience. Died March 21.

Georg W. Claussen, 100. The CEO at Beiersdorf AG, the Hamburg-based maker of Nivea skin cream, from 1957 to 1979. Died March 21.

Ray Williams, 58. A former guard in the National Basketball Association whose 10-year career included stints with the New York Knicks and New Jersey Nets. Died March 22.

Boris Berezovsky, 67. He was one of the first and best-known oligarchs who accumulated vast wealth and influence in post-Soviet Russia until a falling out with Russian President Vladimir Putin. Died March 23 at his home near London, where he lived in self-imposed exile.

Virgil “Fire” Trucks, 95. Hurled two no-hitters in 1952 for Major League Baseball’s Detroit Tigers. Died March 23.

Anthony Lewis, 85. Former New York Times reporter and columnist, who won two Pulitzer Prizes and transformed coverage of the U.S. Supreme Court. Died March 25 of renal and heart failure.

Guillermo Luksic Craig, 57. Chairman of Chilean holding company Quinenco SA, and a member of Chile’s richest family. Died March 27 of lung cancer.

Ralph Klein, 70. The premier of Alberta, Canada’s oil-rich province, from 1992 to 2006. Died March 29 of dementia and lung disease.

Mal Moore, 73. He was part of 10 national championship college football teams as a player, coach and athletic director at the University of Alabama. Died March 30 of pulmonary disease.

April

Jack Pardee, 76. The All-American linebacker at Texas A&M University, who played in the NFL and then coached the league’s Chicago Bears, Washington Redskins and Houston Oilers. Died April 1 of gall bladder cancer.

Barbara Piasecka Johnson, 76. The Polish-born cook and chambermaid who married Johnson & Johnson heir J. Seward Johnson, won $350 million in a legal battle with his children over his will, and wound up a billionaire art collector and philanthropist living in Monaco. Died April 1 in Poland.

Calvert Crary, 69. A Wall Street lawyer whose newsletter, “Litigation Notes,” predicted the outcome of corporate court battles for an audience of hedge fund managers and institutional investors. Died April 6.

Margaret Thatcher, 87. The U.K. prime minister from 1979 to 1990, known as the “Iron Lady” for her strong will, who helped end the Cold War and revived Britain’s economy by deregulating

financial markets, lowering taxes and privatizing companies. Died April 8 of a stroke in London.

Annette Funicello, 70. She was the most popular of the original Mouseketeers on Walt Disney's "The Mickey Mouse Club" television show in the 1950s, then had a career as an actress and singer. Died April 8 of complications from multiple sclerosis, in California.

Robert G. Edwards, 87. A British physiologist, his research on in-vitro fertilization led to the first test-tube baby, earning him the Nobel Prize for Medicine in 2010. Died April 10.

George Schaefer, 84. As chairman and CEO of Caterpillar Inc. from 1985 to 1990, he led the construction equipment maker from losses to record profits. Died April 10 in Peoria, Illinois, the company's hometown.

Jonathan Winters, 87. The American stand-up comic, whose improvisational humor, starting in the 1950s, inspired comedians such as Robin Williams and Jim Carrey. Died April 11.

Maria Tallchief, 88. One of the premier U.S. ballerinas of the 20th century, and the wife of choreographer George Balanchine. Died April 11.

Colin Davis, 85. The British-born principal conductor of the London Symphony Orchestra from 1995 to 2006. Died April 14.

George Beverly Shea, 104. Known as "America's Beloved Gospel Singer," he performed before more than 200 million people during six decades with evangelist Billy Graham. Died April 16.

Pat Summerall, 82. The former NFL player, who teamed with John Madden for 21 years to form one of the most popular broadcasting pairings in television history. Died April 16.

Al Neuharth, 89. He built Gannett Co. into the largest U.S. newspaper publisher and created USA Today, which became the country's biggest-selling daily paper. Died April 19 of

complications from a fall.

Cortright McMeel, 41. He drew on his experience in the commodities market to write a darkly comic novel about energy traders. Died April 19 in Denver, where he lived.

Dirce Navarro de Camargo, 100. She became Brazil's richest woman after inheriting Camargo Correa SA, now the nation's third-largest construction company, founded by her late husband, Sebastiao Camargo. Died April 20.

Richie Havens, 72. The Brooklyn-born folk singer best known as the opening act at the Woodstock music festival in 1969. Died April 22 of a heart attack.

Kathryn Wasserman Davis, 106. She gave her husband about $100,000 in 1947 to open his own investment firm, Shelby Cullom Davis & Co., which was valued at $800 million when he died in 1994. Died April 23.

George Jones, 81. The country-music singer, whose emotion-drenched vocal style earned him more hit records than any other artist. Died April 26 in Nashville, Tennessee.

Tim Taylor, 71. He was Yale University's ice hockey coach for 28 seasons, winning six Ivy League titles. Died April 27 of cancer.

Janos Starker, 88. A Hungarian-born child prodigy, who became one of the most renowned cellists of the 20th century and ended his career as a distinguished professor of music at Indiana University. Died April 28.

Edward Feigeles, 58. He was a managing director at Lehman Brothers Holdings Inc. in New York, where he led the private client services group, from 1996 to 2005. Died April 29 after a brief illness.

Bill Mahoney, 55. He led global sales and marketing at Westport, Connecticut-based Bridgewater Associates LP, the world's largest hedge fund, before leaving in 2006. Died April 30 of pancreatic

cancer.

May

William Cox Jr., 82. The patriarch of the Bancroft clan that for 105 years controlled New York-based Dow Jones & Co., publisher of the Wall Street Journal, who helped persuade the extended family to sell the company to Rupert Murdoch's News Corp. in 2007. Died on May 1 of complications from diabetes.

Giulio Andreotti, 94. The seven-time Italian prime minister, whose political career embodied the highs and lows of Italian postwar governance. Died May 6.

Salvatore J. Trani, 72. He helped rebuild the credit unit of Cantor Fitzgerald LP's BGC Partners Inc. after 658 of the firm's employees were killed in the Sept. 11, 2001, attacks on New York's World Trade Center. Died May 7 of brain cancer.

George Sauer Jr., 69. Playing wide receiver for the National Football League's New York Jets, he caught eight passes from quarterback Joe Namath in the 1969 Super Bowl, which the underdog Jets won. Died May 7 of Alzheimer's disease.

Alan Abelson, 87. A U.S. financial journalist, who was a former top editor at Barron's magazine and wrote a widely followed stock-market column. Died May 9 of a heart attack.

Andrew Simpson, 36. A British sailor who won two Olympic medals in sailing for Britian. Died May 9 when a yacht attempting to compete for the America's Cup capsized in San Francisco Bay.
Ottavio Missoni, 92. The founder of Missoni SpA, a high-end Italian fashion company. Died May 9.

Deborah Bernstein, 41. She became a partner at Aquiline Capital Partners LLC, a New York-based private equity firm, after starting her career at Goldman Sachs. Died May 10 of cancer.

Walter J. O'Brien III, 46. The head of equities sales and trading at BB&T Corp., North Carolina's second-biggest bank, and

a mentor to finance-minded graduates of the University of Richmond, his alma mater. Died May 10 of colon cancer.

Joyce Brothers, 85. Armed with a Ph.D. in psychology, she became a pioneer in dispensing advice about love, self-image and sex on U.S. television and radio and syndicated newspaper columns, starting in the late 1950s. Died May 13 of respiratory failure.

Chuck Muncie, 60. A running back for the NFL's New Orleans Saints and San Diego Chargers who in 1981 set a record for rushing touchdowns in a season and then had his career cut short because of cocaine use. Died May 13 of a heart attack.

Jorge Rafael Videla, 87. Argentina's military junta leader, who oversaw a campaign of murder and kidnapping from 1976 to 1981. Died May 17 in a Buenos Aires prison, where he was serving a life sentence for human rights violations.

Ken Venturi, 82. The American golfer who won the 1964 U.S. Open and spent 35 years as a TV golf analyst. Died May 17 of a spinal infection and pneumonia.

Isabel Benham, 103. Her mastery of U.S. railroad financing in the 1930s made her an influential bond analyst and in 1964 she became the first female partner at R.W. Pressprich & Co., a Wall Street firm. Died May 18.

Ray Manzarek, 74. The keyboardist and songwriter who with Jim Morrison founded The Doors, a 1960s U.S. rock group that sold more than 100 million records. Died May 20 of bile duct cancer.

John Q. Hammons, 94. He created John Q. Hammons Hotels in 1969 and became the largest private, independent upscale-hotel manager in the U.S., developing properties for brands such as Marriott, Renaissance and Embassy Suites. Died May 26.

Roberto Civita, 76. An Italian-born entrepreneur, who became the billionaire chairman of Grupo Abril, which publishes some of Brazil's most-read magazines. Died May 26 of complications from an abdominal aneurysm.

Cullen Finnerty, 30. The former college football star who led Grand Valley State University's team to three Division II national championships and won more than 50 games over four seasons as the school's quarterback. Died between May 26 and May 28 of pneumonia after disappearing while on a fishing trip in Michigan.

Charles Henderson, 88. He was the fourth generation of his family to run Henderson Brothers Inc., a specialist floor trading firm on Wall Street. Died May 29 of heart failure.

George H. Weiler III, 69. Senior vice president for wealth-management services at UBS AG, who started his Wall Street career in 1984 at Dillon Read & Co. Died May 29 of a heart attack.

June

Raymond Saxe, 50. A former senior vice president of global risk technology at HSBC Holdings Plc, who worked on Wall Street for 21 years. Died June 1.

Michael McClintock, 55. Senior managing director in New York for Macquarie Group Ltd., Australia's biggest investment bank. Died June 2 of cardiac arrest.

Chen Xitong, 82. The mayor of Beijing during the 1989 Tiananmen Square protests in which hundreds of people were killed. Died June 2 of cancer.

Hugh P. Lowenstein, 82. A managing director of Donaldson, Lufkin & Jenrette in the 1990s, founder of Shore Capital Ltd. in Bermuda and a director of Bloomberg LP, parent company of Bloomberg News, for more than 15 years. Died June 2.

Frank Lautenberg, 89. The five-term Democratic senator from New Jersey who wrote laws raising the legal drinking age to 21 and banning smoking on domestic airline flights. Died June 3 of complications from viral pneumonia.

Deacon Jones, 74. A Hall of Fame defensive end, who was the NFL's defensive player of the year in 1967 and 1968 when he played for the Los Angeles Rams. Died June 3.

Esther Williams, 91. The U.S. swimming champion who was best known as a movie actress in aquatic musicals in the 1940s and 1950s. Died June 6.

William L. Clayton, 83. During his 55-year career on Wall Street, he spent almost four decades at E.F. Hutton & Co. and founded Hutton Capital Management. Died June 7 of Parkinson's disease.

Robert Fogel, 86. The University of Chicago economist, who won a Nobel Prize in 1993 for his historical analysis of how railroads and slavery shaped U.S. economic history. Died June 11.

Miller Barber, 82. A U.S. golfer who made a record 1,297 combined starts on the U.S. PGA and Champions golf tours, winning 35 titles. Died June 11.

Jiroemon Kimura, 116. He was recognized by Guinness World Records as the oldest male in recorded history. Died June 12 in his hometown of Kyotango, in western Japan.

Paul Soros, 87. The Hungarian-born founder of Soros Associates, a New York-based builder of shipping ports, and the older brother of billionaire investor George Soros. Died June 15.

Mathew Gladstein, 90. Working with future Nobel winners Robert Merton and Myron Scholes, he helped popularize options trading while working at Donaldson Lufkin & Jenrette in New York. Died June 18.

Gyula Horn, 80. The prime minister of Hungary from 1994 to 1998, who as foreign minister in 1989 helped trigger events that led to the fall of the Berlin Wall. Died June 19.

James Gandolfini, 51. The New Jersey-born actor best known for

portraying the conflicted mob boss Tony Soprano in the TV series "The Sopranos." Died June 19 of a heart attack while on vacation in Rome.

Dave Jennings, 61. An All-Pro punter who played for New York's two NFL teams, the Giants (1974 to 1984) and Jets (1985 to 1987). Died June 19 from Parkinson's disease.

Allan Simonsen, 34. A Danish race car driver affiliated with the Aston Martin Racing Team. Died June 22 when his car crashed at the Le Mans 24 hours race.

Bobby "Blue" Bland, 83. A Tennessee-born singer of Southern blues and ballads in hit singles such as "Turn on Your Love Light," who was inducted into the Rock and Roll Hall of Fame. Died June 23.

Harry Parker, 77. He coached the Harvard University men's heavyweight crew team to 22 undefeated seasons and eight national titles. Died June 25 of a blood disorder.

Marc Rich, 78. The Belgium-born commodities trader, who in 1983 was indicted for U.S. income tax evasion and racketeering, fled the country and lived as a fugitive until pardoned by President Bill Clinton in 2001. Died June 26 near his home in Switzerland.

Rawleigh Warner, 92. As the chairman and CEO of Mobil Oil Corp. from 1969 to 1986, he outmaneuvered competitors to make Mobil second in sales behind Exxon Corp., years before the companies merged. Died June 26 of complications from a progressive muscle disease.

July

William H. Gray III, 71. He was a Democrat from Philadelphia who served six terms in the U.S. House of Representatives, becoming the first black party whip, the No. 3 leadership position. Died July 1 while in London to attend the Wimbledon tennis tournament.

Andrew McMenigall, 47. A senior global equities manager at Scotland's Aberdeen Asset Management Plc, who was based in Edinburgh. Died July 2 in a traffic accident while participating in a charity bicycle ride across Britain.

Toby Wallace, 36. He was a Philadelphia-based senior relationship manager at Aberdeen Asset Management Plc. Died July 2 of injuries suffered from a traffic accident while taking part in a charity bicycle ride across Britain.

Douglas Engelbart, 88. The U.S. electrical engineer who invented the computer mouse, the design of which was described in a patent filed in 1967 and granted in 1970. Died July 2 of kidney failure.

Cynthia Lufkin, 51. The philanthropist wife of Dan Lufkin, co-founder of Wall Street firm Donaldson, Lufkin & Jenrette. Died July 3 of complications from breast and lung cancer.

Douglas J. Dayton, 88. The son of a successful U.S. retailer, he became the first president of Target, a U.S. department store chain. Died July 5 of cancer.

Masao Yoshida, 58. The plant manager of Japan's Fukushima nuclear reactor in March 2011, when an earthquake and ensuing tsunami crippled the facility in the worst nuclear disaster since Chernobyl in eastern Europe. Died July 9 of esophageal cancer.

Philip Caldwell, 93. He was the first CEO of Ford Motor Co. who wasn't a member of the Ford family. Died July 10 of complications from a stroke.

Amar Bose, 83. An engineer who taught at Massachusetts Institute of Technology for more than four decades, he was best known as the billionaire founder of Bose Corp., an audio technology company specializing in speakers and headphones located in Framingham, Massachusetts. Died July 12.

Cory Monteith, 31. The Canadian-born actor was best known for

starring in the hit TV show “Glee.” Died July 13 of a drug overdose.

Herbert Allison Jr., 69. He was the former president of Merrill Lynch & Co., chairman and CEO of TIAA-CREF, CEO of Fannie Mae and led the U.S. government’s bank bailout program. Died July 14.

Neal McCabe, 60. He was a Boston-born former global co-head of a Lehman Brothers Holdings Inc. unit focused on increasing trades with security dealers worldwide. Died July 17, two months after suffering a stroke.

Donald J. Mulvihill, 56. He was a managing director at Goldman Sachs, who started the firm’s asset-management business in Japan and created tax-focused funds in the U.S. during his 33-year career with the bank. Died July 19 of leukemia in Illinois, where he was born and raised.

Helen Thomas, 92. The pioneering female journalist who worked as White House correspondent for United Press International, where she worked for 57 years, and as a columnist for Hearst Newspapers. Died July 20.

Carsten Schloter, 49. The German-born CEO of Swisscom AG, Switzerland’s biggest telecommunications company, since 2006. Died July 23 of what police called an apparent suicide.

Emile Griffith, 75. Former U.S. welterweight and middleweight boxing champion best known for his fatal knockout of Benny Paret in a nationally televised fight in 1962. Died July 23.

Dennis Dammerman, 67. He was CEO Jack Welch’s right-hand man at
General Electric Co., where at age 38 he became the company’s youngest chief financial officer and then ran GE Capital. Died July 23.

Arthur Makadon, 70. The chairman of Ballard Spahr LLP, a Philadelphia-based law firm, from 2002 to 2011. Died July 24 of

cancer.

Virginia Johnson, 88. One of the key figures in the sexual revolution in postwar America, she conducted groundbreaking research in human sexuality with her collaborator, William Masters. Died July 24.

Barnaby Jack, 36. A New Zealand-born computer-security professional who exposed how hackers could attack bank automated teller machines, insulin pumps and other electronic devices. Died July 25.

Lindy Boggs, 97. She spent 18 years in the U.S. House of Representatives, succeeding her husband, Hale Boggs, and worked as a champion for women's rights. Died July 27.

George "Boomer" Scott, 69. Large, strong and agile, he spent nine of his 14 seasons in Major League Baseball with the Boston Red Sox, playing first base and leading the team to win the American League pennant in 1967. Died July 28.

Peter Flanigan, 90. The former Dillon Read investment banker, who worked as deputy campaign manager for Richard Nixon's successful 1968 presidential run, then joined the administration as an adviser on business and economic matters. Died July 29.

Berthold Beitz, 99. German industrialist who hid Jews from the Nazis during World War II and then helped rebuild Fried Krupp GmbH, a predecessor of the country's biggest steelmaker. Died July 30.

August

Art Donovan, 88. An NFL Hall of Fame defensive tackle who won two championships with the Baltimore Colts in the 1950s. Died Aug. 4.

E. Nelson Asiel, 96. Third-generation leader of Asiel & Co., a Wall Street brokerage firm founded by his grandfather, Elias, in 1878. Died Aug. 5.

Jerry Wolman, 86. He owned the NFL's Philadelphia Eagles team from 1963 to 1969. Died Aug. 6.

Karen Black, 74. The U.S. actress best known for her performances in "Five Easy Pieces," "Easy Rider" and "Nashville." Died Aug. 8 of cancer.

Lorraine Lodge, 52. She was a convertible bond specialist during a career in New York and London at Merrill Lynch, ING Barings and Nomura Holdings Inc. Died Aug. 8 of ovarian cancer in New York, where she lived.

Lee Quo-wei, 95. The former chairman of Hong Kong's Hang Seng Bank Ltd. and in 1969 was part of the group that created the Hang Seng Index, the city's benchmark stock gauge. Died Aug. 10.

Eydie Gorme, 84. American pop music singer best known for her 1963 hit "Blame It on the Bossa Nova," and for nightclub and television performances with her husband, Steve Lawrence. Died Aug. 10.

Friso van Oranje, 44. A member of the royal family in the Netherlands, he gave up his place in line for the throne to marry the woman he loved. Died Aug. 12 of complications from brain damage suffered in a skiing accident in February 2012.

John H. Laporte, 68. He worked at Baltimore-based T. Rowe Price Group Inc. from 1976 until retiring in 2012 and was named mutual fund manager of the year in 1995. Died Aug. 12 of complications from lymphoma.

Louis V. Gerstner III, 41. The son of Louis Gerstner Jr., the former CEO of International Business Machine Corp., and president of the Gerstner Family Foundation. Died Aug. 14 after choking while dining in a New York restaurant.

Elmore Leonard, 87. Known as the "Dickens of Detroit," Leonard was the best-selling author of crime novels and Westerns, many of which were made into movies, including "Get Shorty" and

“Hombre.” Died Aug. 20 of complications from a stroke.

Marian McPartland, 95. The British-born jazz pianist, whose National Public Radio show, in which she interviewed and played with musicians from Benny Goodman to Elvis Costello, was broadcast for more than three decades. Died Aug. 20 at her home in New York.

Ronald L. Motley, 68. A South Carolina lawyer, he led lawsuits against tobacco companies, resulting in a payout of $246 billion, the biggest civil settlement in U.S. history. Died Aug. 22 from complications of organ failure.

Julie Harris, 87. The U.S. actress who appeared in 30 Broadway plays and won five Tony awards. Died Aug. 24 of congestive heart failure.

Muriel Siebert, 84. The first woman to buy a seat on the New York Stock Exchange, in 1967, founder of Muriel Siebert & Co., a discount brokerage, and the first female superintendent of banks for New York State. Died Aug. 24 of complications from cancer.

Eric T. Miller, 85. The former chief investment officer for New York-based Donaldson Lufkin & Jenrette, who called the stock-market bottom in 1982 and whose “Random Gleanings ” market commentary was widely followed by investors. Died on Aug. 29 of complications from brain cancer.

Seamus Heaney, 74. Irish poet who won the Nobel Prize in Literature in 1995. Died Aug. 30.

David Brenneman, 37. He was an executive director in equity risk management at Morgan Stanley in New York, who previously worked at Banc of America Securities and Davis Polk & Wardwell LLP. Died Aug. 31 of cancer.

David Frost, 74. The British television interviewer best known for his 1977 interviews with former President Richard Nixon, which became the basis for the 2008 movie “Frost/Nixon.” Died Aug. 31 of a heart attack aboard the Queen Elizabeth cruise

ship.

September

Tommy Morrison, 44. In 1993, he defeated George Foreman to win the World Boxing Organization heavyweight title and appeared in the movie “Rocky V.” Died Sept. 1.

Ronald Coase, 102. The British-born University of Chicago economist who won the Nobel Prize in 1991 for research he said showed that “people will use resources in the way that produces the most value.” Died Sept. 2.

Joseph Granville, 90. He was a U.S. financial newsletter writer and technical analyst who moved stock markets with bearish calls in the 1970s and 1980s. Died Sept. 7.

Ray Dolby, 80. He was a U.S. inventor who became a billionaire by designing noise-reduction and surround-sound technologies used in films, movie theaters and home-theater equipment. Died Sept. 12 of leukemia.

Ken Norton, 70. The U.S. boxer who was a former world heavyweight champion and gained fame by breaking Muhammad Ali’s jaw during a match. Died Sept. 18 after suffering a series of strokes.

Joy Covey, 50. She joined Amazon.com Inc. during its pioneering days as an Internet retailer, serving as its chief financial officer when the company held its initial public offering in 1997. Died Sept. 18 in a bicycle accident in California, where she lived.

Hiroshi Yamauchi, 85. The great-grandson of Nintendo Co.’s founder, running the company for 53 years and becoming Japan’s richest person in 2008. Died Sept. 19.

Douglas Millett, 49. He was director of research at New York-based Kynikos Associates Ltd., who called Enron Corp. “a hedge fund sitting on top of a pipeline” and helped expose the energy

company's financial problems. Died Sept. 21 of cancer.

Richard T. McSherry, 77. The co-founder, along with James Elkins, of New York-based Elkins/McSherry LLC, which pioneered a way to crunch data to assess trading costs and help institutional investors maximize profits. Died Sept. 26 of prostate cancer.

L.C. Greenwood, 67. The four-time NFL Super Bowl champion, who played defensive end on the Pittsburgh Steelers' defensive line known as the "steel curtain" in the 1970s. Died Sept. 29.

October

Tom Clancy, 66. The U.S. author of "The Hunt for Red October" and "Patriot Games," he became one of the world's best-known writers by infusing espionage thrillers with technical details about military weaponry and intelligence agencies. Died Oct. 1.

Karen Strauss Cook, 61. In 1975, she became the first woman hired in Goldman Sachs's equities division, and the firm's first female trader. Died Oct. 2 of a degenerative brain disease in New York, where she lived.

Amy Dombroski, 26. The U.S. bicyclist who was a three-time national cyclo-cross champion. Died Oct. 3 when struck by a vehicle while training in Belgium.

Sergei Belov, 69. He played guard on the Soviet Union's basketball team that beat the U.S. to win a gold medal in the 1972 Olympics. Died Oct. 3.

Vo Nguyen Giap, 102. The North Vietnamese general whose fighters drove the French out of Vietnam in 1954, then served as commander-in-chief against U.S. forces during the Vietnam War. Died Oct. 4.

Ovadia Yosef, 93. An ultra-Orthodox rabbi who galvanized Israel's Jews of Middle Eastern and North African descent into a political force with the Shas Party. Died Oct. 7.

Paul Desmarais Sr., 86. The Canadian billionaire, who turned an inherited fleet of buses into Power Corp. of Canada, an insurance and financial services conglomerate. Died Oct. 8.

Scott Carpenter, 88. The second American to orbit the Earth, he was one of the original seven astronauts in Project Mercury, the first U.S. human spaceflight program. Died Oct. 10 of complications from a stroke.

Wilfried Martens, 77. A former prime minister of Belgium, who presided over nine governments from 1979 to 1992, deepening the nation's integration in the European Union while leaving a legacy of debt. Died Oct. 10.

Wally Bell, 48. A Major League Baseball umpire for 21 years. Died Oct. 14 of a heart attack.

Hans Riegel, 90. The German billionaire owner of Haribo GmbH, a candy maker started by his father, whose best-known product is the Gummy Bear. Died Oct. 15 of heart failure.

Peter A. Levy, 77. He followed the path of his father, Gustave Levy, becoming a partner at Goldman Sachs, until departing to co-found investment funds, including Harmony Capital Management LP, a New York-based fund of private-equity funds. Died Oct. 18 of cancer.

Tom Foley, 84. He was a Democratic congressman from Washington State from 1964 to 1994 and rose to speaker of the House. Died Oct. 18 of pneumonia following a series of strokes.

Sally Dawson, 39. A British-born banker who spent 17 years at the London office of Deutsche Bank AG, specializing in high-yield and distressed-debt sales. Died Oct. 18 of cancer.

C.W. "Bill" Young, 82. A U.S. representative from Florida, he was the longest-serving Republican in Congress and an advocate of military spending. Died Oct. 18 of complications following surgery.

Oail “Bum” Phillips, 90. A Texan who spent 12 seasons as a coach in the NFL for the Houston Oilers and New Orleans Saints, pacing the sidelines in cowboy boots, jeans and a Stetson hat. Died Oct. 18.

William C. Lowe, 72. He supervised the production of International Business Machines Corp.’s first personal computer, in 1980. Died Oct. 19 of a heart attack.

Lawrence Klein, 93. The U.S. economist who won the 1980 Nobel Prize for developing computer models to help predict global economic trends. Died Oct. 20.

Jamalul Kiram III, 75. A Philippine sultan, who waged an armed struggle for control over Malaysia’s Sabah state, an area rich in natural resources. Died Oct. 20 of kidney disease.

Juliette Moran, 96. She joined GAF Corp. in 1943 when it was a New York-based chemical maker, rising to vice chairman in 1980. Died Oct. 20.

Don James, 80. In 1975, he became the head coach of the University of Washington’s football team, winning a share of the national title in 1991. Died Oct. 20 of pancreatic cancer.

K.S. “Bud” Adams, 90. Owner of the NFL’s Houston Oilers team and its successor, the Tennessee Titans, he helped found the American Football League in 1960. Died Oct. 21.

Anthony Caro, 89. A British sculptor, who created large art objects with heavy steel girders, metal sheets, pipes and scrap metal and was knighted in 1987. Died Oct. 23 of a heart attack.

Paul Reichmann, 83. One of three brothers who built Toronto-based Olympia & York Developments Ltd. in building London’s Canary Wharf and New York’s World Financial Center before it filed for bankruptcy in 1992. Died Oct. 25.

Bill Sharman, 87. He was elected to the Basketball Hall of Fame

twice, first as a player, in 1976, and then as a coach, in 2004, a feat achieved only by John Wooden and Lenny Wilkens. Died Oct. 25 following a stroke.

Kimberly Mounts, 48. She founded MAP Alternative Asset Management Co. in Newport Beach, California, in 2006, following jobs at Goldman Sachs and Morgan Stanley. Died Oct. 25 of cardiac arrest.

Gilbert Beebower, 79. A co-author of a 1986 article demonstrating the superiority of asset allocation compared with market timing and stock picking, who worked at SEI Investments Co. in Oaks, Pennsylvania, from 1975 until his death. Died Oct. 25.

Lou Reed, 71. The New York-based rock musician, who co-founded the Velvet Underground and became one of rock music's most influential artists. Died Oct. 27 of complications from a liver transplant.

Leonard M. Leiman, 82. He led the securities-law practice at New York-based Reavis & McGrath when it merged in 1988 with Houston-based Fulbright & Jaworski, creating the seventh-largest U.S. law firm at the time. Died Oct. 30.

November

Walt Bellamy, 74. A member of the NBA Hall of Fame, he was one of only seven players to score more than 20,000 points and grab more than 14,000 rebounds. Died Nov. 2.

Rachel Benepe, 37. A U.S. protege of stock-picker Jean-Marie Eveillard at First Eagle Investment Management LLC, who managed its $1.5 billion First Eagle Gold Fund since 2009. Died Nov. 2 of cancer.

Charlie Trotter, 54. The Chicago-based chef who closed his namesake restaurant in 2012 after a 25-year run in which it won 11 James Beard Foundation Awards. Died Nov. 5.

Clarence “Ace” Parker, 101. Inducted into the Pro Football Hall of Fame in 1972, he played on New York teams in the 1940s, and twice spent the off-season playing baseball with the Philadelphia Athletics. Died Nov. 6.

Manfred Rommel, 84. He served as the former mayor of Stuttgart, Germany, for 22 years and was the son of Erwin Rommel, the German field marshal during World War II. Died Nov. 7 of Parkinson’s disease.

Sally Lloyd, 64. A third-generation banker who started her career in the early 1970s when few women worked on Wall Street and rose to managing director at Smith Barney. Died Nov. 11 of cancer.

John Tavener, 69. The U.K. composer best known for works such as “Song for Athene,” played at the funeral of Diana, Princess of Wales. Died Nov. 12.

Todd Christensen, 57. An NFL player from 1979 to 1988, who won two Super Bowl titles with the Oakland Raiders as a tight end and was voted All-Pro four times. Died Nov. 13 of complications from surgery.

Glafcos Clerides, 94. While president of Cyprus from 1993 to 2003, he oversaw the country’s entrance into the European Union in 2004. Died Nov. 15.

Doris Lessing, 94. The British author won the Nobel Prize in literature in 2007 and is best-known for “The Golden Notebook,” a story about an independent-minded woman growing up in Africa. Died Nov. 17.

G. Moffett Cochran, 63. The co-founder and CEO of New York-based Silvercrest Asset Management Group Inc., a firm serving wealthy families. Died Nov. 18 of cancer.

Michael Weiner, 51. As executive director of the Major League Baseball Players Association since 2009, he helped keep labor peace in the sport. Died Nov. 21 of cancer.

Peter B. Lewis, 80. The billionaire chairman of Progressive Corp., one of the biggest U.S. auto insurers, and a supporter of the medical use of marijuana. Died Nov. 23 of a heart attack at his home in Coconut Grove, Florida.

Robin Leigh-Pemberton, 86. He was Bank of England governor from 1983 to 1993. Died Nov. 24.

Matthew Bucksbaum, 87. The co-founder of General Growth Properties Inc., the second-biggest U.S. owner of shopping malls. Died Nov. 24 of respiratory failure.

Alfred Feld, 98. The longest-serving employee at Goldman Sachs, who joined the firm in 1933 and rose from office boy to private-wealth manager. Died Nov. 25.

Peter W. Kaplan, 59. The former editor of the New York Observer, which under his leadership chronicled the lives of New York's power elite and ran the column, "Sex and the City," which inspired a hit television series. Died Nov. 29 of cancer.

Paul Walker, 40. A Hollywood actor best-known for appearing in the "Fast and Furious" action movies. Died Nov. 30 of injuries as a passenger involved in a car crash.

December

Nelson Mandela, 95. The anti-apartheid freedom fighter, who endured 27 years in prison to become South Africa's first black president, then united the country and won the Nobel Peace Prize in 1993. Died Dec. 5 following a recurring lung infection.

Lawrence McCarthy, 49. Before becoming a senior managing director at Cantor Fitzgerald, he worked at Wasserstein Perella & Co., where he advised clients to sell Enron prior to its collapse, and at Lehman Brothers, where he warned colleagues in 2007 that the bank had taken on "far, far too much risk" by betting on the U.S. housing market. Died of an aneurysm on Dec. 11 in New York.

Peter O'Toole, 81. The British actor, who became an international star in 1962 for playing the lead in "Lawrence of Arabia" and received four Golden Globe awards and eight Oscar nominations. Died December 14.

Dennis Busti, 71. He was the CEO of corporate raider Saul Steinberg's Reliance National Insurance Co., a unit created to handle high-risk insurance coverage for clients such as nuclear-plant operators. Died Dec. 14 at his home in Eastchester, New York.

Joan Fontaine, 96. Born in Tokyo to British parents, the actress spent most of her life in the U.S. and won an Academy Award for best actress for her performance in the 1941 Alfred Hitchcock film "Suspicion," beating her sister, Olivia de Havilland, for the honor. Died Dec. 15.

Graham Mackay, 64. The former CEO of London-based SABMiller Plc,
who built the company into the world's second-biggest brewer and acquired Australia's Foster's Group Ltd. in 2011 and Miller Brewing Co., a U.S. beer maker, in 2002. Died Dec. 18.

Ronnie Biggs, 84. He helped stage Britain's Great Train Robbery in 1963, escaped from prison and eluded Scotland Yard for 36 years before giving himself up in 2001. Died Dec. 18 after a series of strokes.

Al Goldstein, 77. A Brooklyn-born pornographer who published Screw magazine, hosted a public access cable-TV show in New York during the city's sleazy days in the 1970s, before Times Square was cleaned up and drawing families to "The Lion King." Died Dec. 19.

Sergio Loro Piana, 65. The Italian cashmere clothier, who along with his brother, Pier Luigi Loro Piana, became billionaires after selling 80 percent of their company, Loro Piana SpA, to Paris-based LVMH Moet Hennessy Louis Vuitton SA. Died Dec. 19.

John S.D. Eisenhower, 91. The son of former U.S. President Dwight Eisenhower, he was a brigadier general in the U.S. Army Reserve, wrote books on military history and was appointed ambassador to Belgium by President Richard Nixon in 1969. Died Dec. 21.

Edgar M. Bronfman, 84. The Canadian-born second-generation heir who expanded the Seagram Co. with oil, gas and chemical investments and served as president of the World Jewish Congress from 1981 to 2007. Died Dec. 21 at his home in New York.

Mikhail Kalashnikov, 94. He was the Russian inventor of what would become the world's most popular assault rifle, the AK-47. Died Dec. 23.

Robert W. Wilson, 87. He founded a New York-based hedge fund, amassed a net worth of about $800 million and gave most of it to charities, primarily conservation groups. Died Dec. 23 of suicide.

--Editors: Charles W. Stevens, David Henry

http://www.bloomberg.com/news/2013-12-26/thatcher-mandela-chavez-are-among-notable-deaths-in-2013.html

IN THE CIRCUIT COURT OF THE FIFTEENTH JUDICIAL CIRCUIT, IN AND FOR PALM BEACH COUNTY, FLORIDA

CASE NO.: 502009CA040800XXXXMBAG

JEFFREY EPSTEIN,

Plaintiff,

vs.

SCOTT ROTHSTEIN, individually, BRADLEY J. EDWARDS, individually, and L.M., individually,

Defendant,

_____/

DEFENDANT/COUNTER-PLAINTIFF'S RESPONSE IN OPPOSITION TO PLAINTIFF/COUNTER-DEFENDANT'S MOTION FOR SUMMARY JUDGMENT ON DEFENDANT/COUNTER-PLAINTIFF'S FOURTH AMENDED COUNTERCLAIM

Defendant/Counter-Plaintiff Bradley J. Edwards, by and through his undersigned counsel, hereby submits this Response in Opposition to Plaintiff/Counter-Defendant Jeffrey Epstein's Motion for Summary Judgment. Epstein seeks Summary Judgment on the claims of abuse of process and malicious prosecution set forth in Brad Edwards' Fourth Amended Counterclaim. Each of the grounds asserted in support of Epstein's Motion for Summary Judgment are without merit and must be denied.

In Epstein's Amended Complaint he carries forth the essence of all claims asserted in his original Complaint. In that pleading Epstein essentially alleges that Edwards joined Rothstein in the abusive prosecution of sexual assault cases against Epstein to "pump" the cases to Ponzi scheme investors. The purported "proof" of the allegations against Edwards, as referenced in the Second Amended Complaint and in Epstein's Motion for Summary Judgment, includes Edwards' alleged contacts with the media, his attempts to obtain discovery from high profile persons with whom Epstein socialized, press reports of Rothstein's known illegal activities, the use of "ridiculously inflammatory" language and arguments in court. But as the evidence submitted in opposition to Epstein's Motion for Summary Judgment reflects, Epstein filed his claims and continued to pursue claims despite his knowledge that his claims could never be successful because they were both false and unsupported by any reasonable belief of suspicion that

they were true. Epstein knew that he had in fact molested each of the minors represented by Brad Edwards. He also knew that each litigation decision by Brad Edwards was grounded in proper litigation judgment about the need to pursue effective discovery against Epstein, particularly in the face of Epstein's stonewalling tactics. Epstein also knew that he suffered no legally cognizable injury proximately caused by the falsely alleged wrongdoing on the part of Edwards. Moreover, Epstein had no intention of waiving his Fifth Amendment privilege against self-incrimination in order to avoid providing relevant and material discovery that Epstein would need in the course of prosecuting his claims and to which Edwards was entitled in defending those claims. Epstein knew that his prosecution of his claims would be barred by the sword-shield doctrine. Most significantly, the evidence submitted in the supporting papers would compel a fact finder to determine that Epstein had no basis in law or in fact to pursue his claims against Edwards and that Epstein was motivated by a single ulterior motive to attempt to intimidate Edwards and his clients and others into abandoning or settling their legitimate claims for less than their just and reasonable value. The evidence demonstrates that Epstein did not file these claims for the purpose of collecting money damages since he knew that he never suffered any damage as a consequence of any alleged wrongdoing by Edwards but filed the claim to require Edwards to expend time, energy and resources on his own defense, to embarrass Edwards and impugn his integrity and deter others with legitimate claims against Epstein from pursuing those claims. Indeed, the evidence demonstrates that Epstein continued to pursue his claims by filing the Second Amended Complaint alleging abuse of process against Edwards *even after* he had paid significant sums in settlement of the claims instituted by Mr. Edwards' clients against Mr. Epstein.[1]

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[1] The evidence marshalled in support of these assertions is set forth in the previously filed documents in this Court. Those documents include Exhibit "A" – Edwards' Statement of Undisputed Facts; Exhibit "B" – Edwards' Renewed Motion for Summary Judgment; Exhibit "C" – Edwards' October 19, 2012 Second Renewed Motion for Leave to Assert Claim for Punitive Damages; Exhibit "D" – Edwards' Notice of Filing of Transcript of Telephone Interview of Virginia Roberts in Support of Motion for Leave to Amended to Assert Punitive Damages; Exhibit "E" – Transcript of Deposition of Jeffrey Epstein dated January 25, 2012; Exhibit "F' – Deposition of Bradley Edwards dated March 23, 2010; Exhibit "G" - Deposition of Scott Rothstein dated June 14, 2012; Exhibit "H" – Order of

The record reflects that on the eve of the hearing of Edwards' Motion for Summary Judgment directed to the Second Amended Complaint and in light of the compelling evidence of the lack of any wrongdoing on the part of Mr. Edwards, the sole remaining abuse of process claim was dismissed by Epstein.

As discussed, *infra* each of the grounds asserted by Epstein in this Motion for Summary Judgment must be rejected. The litigation privilege does not serve as a bar to the prosecution of Edwards' claims against Epstein. Moreover, the evidence submitted by Edwards supports each of the elements of the claims asserted by Edwards against Epstein which are identified in Epstein's Motion.

Response to Epstein's Statement of Undisputed Facts

The evidence marshalled by Edwards in support of his claims against Epstein which are referenced in footnote 1 mandates the conclusion that, at a minimum, disputed facts exist with respect to the elements of each claim addressed by Epstein in his Motion. The facts presented in the various papers would allow the jury to make a determination that Epstein knew that Brad Edwards properly exercised his legitimate judgment regarding the need to pursue proper and effective discovery against him to support the claims which Epstein knew were legitimate. That evidence, referenced herein, further demonstrated that Epstein filed his claims without probable cause and further that there was a bonafide termination in favor of Edwards. That evidence further demonstrates that the elements of the claim of abusive process have been established.

The following additional comments are directed at some of the key purported "undisputed" material facts asserted by Epstein, especially those referenced in his Memorandum of Law. Also set forth are key evidentiary matters which undermine Epstein's contentions and which support the proposition that material issues of fact exist which compel the denial of the Motion for Summary Judgment.

Judge Crow dated March 29, 2012; Exhibit "I" – Deposition of Bradley Edwards dated October 10, 2013; Exhibit "J" – Deposition of Bradley Edwards dated May 15, 2013.

None of the public materials identified by Epstein in his Motion make reference to any wrongdoing by Brad Edwards. Rather, Epstein seeks to pyramid one impermissible inference upon another from his citation to these materials to support his otherwise unsubstantiated and non-verifiable conclusion that he had sufficient evidence to proceed with claims of wrongdoing against Edwards. In truth, as reflected in Edwards' deposition and his supplemental affidavit, he has no involvement in any fraud perpetrated by Rothstein (Edwards' deposition of March 23, 2010 at 301-302; Edwards Affidavit attached to Statement of Undisputed Facts as Exhibit "N" at paragraphs 8-10, paragraph 20, paragraphs 22-23; Exhibit "H" – Deposition of Scott Rothstein at pp. 62-63, 114, and 121-124). Therefore, any allegations relating to Rothstein's activities simply have no bearing on the legitimacy of any of the claims against Edwards. Edwards could not have possibly "pumped" cases to investors when he never participated in any communications with investors. Rather, Edwards had a duty to his clients to zealously pursue discovery to achieve a maximum recovery against Epstein. Edwards cannot be liable for taking appropriate action that his ethical duties as an attorney required. The evidence also reflects that Edwards filed all three of his cases almost a year before he was hired by RRA or even knew Scott Rothstein (Edwards' Affidavit, Exhibit "N" attached to Statement of Undisputed Facts). The language set forth in his Complaints remain virtually unchanged from the first filing in 2008 and, as the evidence shows, the claims asserted against Epstein from the outset were true. The citation to public documents is a convenient ruse; Epstein was not only liable for the molestation of the clients of Brad Edwards, he was also a serial molester of minors – even as young as twelve years of age (Exhibit "A" – Edwards' Statement of Undisputed Material Facts paragraphs 1-43; Exhibit "D" – Statement of Virginia Roberts pp. 16-17). Epstein entered a plea of guilty to felony charges involving prostitution and the solicitation of a minor for the purposes of prostitution (Exhibit "E" – Deposition of Jeffrey Epstein, March 17, 2010, pp. 101-103). Epstein also entered into an agreement with the United States Attorney's Office acknowledging that approximately 34 other young girls could receive payments from him under the

Federal Statute providing for compensation to victims of child abuse.. (Exhibit "A" – Edwards' Statement of Undisputed Material Facts, paragraphs 41-43).

On July 6, 2010 Epstein ultimately paid to settle all three of the cases Edwards had filed against him (Exhibit "A" – Edwards' Statement of Undisputed Material Facts, paragraphs 84-85). At Epstein's request, the terms of the settlement were kept confidential. The sum that he paid to settle all these cases in therefore not filed with this pleading and will be provided to the court for in camera review. Epstein chose to make this payment as a result of a Federal Court ordered mediation process which he himself sought. Epstein entered into the settlements in July 2010 more than seven months after he filed his lawsuit against Edwards and before he filed his Second Amended Complaint alleging abuse of process on August 22, 2011.

Further, Epstein could not have been the victim of any scheme to pump the cases against him because he never paid to settle the cases until well after Edwards had left RRA and severed all connection with Rothstein in December 2009 (Edwards' Affidavit attached to Statement of Undisputed Facts as Exhibit "N," paragraph 20). Moreover, Epstein could not have suffered any damage as a result of the perpetration of the Ponzi scheme by Rothstein because he was not an investor in the scheme.

Perhaps the most significant evidence presented in opposition to Epstein's Motion for Summary Judgment is the telephone interview of Virginia Roberts submitted in Support of Edwards' Motion for Punitive Damages (Exhibit "D"). In addition to the specious claims against Edwards relating to his alleged involvement in a Ponzi scheme, Epstein, in asserting his claims, primarily relied upon the pursuit by Edwards of testimony from his close friends and associates (See Second Amended Complaint, paragraph 32, pp. 11-13). Reliance on these assertions is also threaded through Epstein's Motion for Summary Judgment in his citation to the public documents referencing the pursuit of such discovery. But as set forth in detail in Edwards' Motion for Final Summary Judgment (Exhibit "B") at pages 14-16, that discovery was entirely appropriate and Epstein knew it. Specifically, as reflected in the statement of

undisputed facts submitted by Mr. Edwards in support of his Motion for Summary Judgment, Edwards had a sound legal basis for believing that Donald Trump, Allen Dershowitz, Bill Clinton, Tommy Mattola, David Copperfield and Governor Bill Richardson had relevant and discoverable information (Exhibit "A" – Edwards' Statement of Undisputed Facts, paragraphs 69-81). That belief was reinforced by the testimony of Virginia Roberts (Exhibit "D" pp. 10-17, 21-23). Epstein's assertion of impropriety in the pursuit of this discovery clearly evidences his bad faith attempts to attribute wrongdoing to Edwards when he knew, in fact, that the pursuit of that discovery was entirely appropriate under the circumstances of this case.

Finally, any attempt by Epstein to rely upon what he claims are undisputed facts to support his Motion for Summary Judgment are undermined by his refusal to provide any testimony on the key issues and evidence which would demonstrate the validity and strength of each of the claims brought against him by Brad Edwards. Epstein's depositions of March 17, 2010 and January 25, 2012 were replete with refusals of Epstein to testify based upon his Fifth Amendment privilege. Questions that Epstein refused to answer in his depositions and the reasonable inferences that a fact finder would draw and which would otherwise bear on the arguments submitted by Epstein in support of his Motion for Summary Judgment are as follows:

- Question not answered: "I want to know whether you have any knowledge of evidence that Bradley Edwards personally ever participated in devising a plan through which were sold purported confidential assignments of a structured payout settlement?" Reasonable inference: No knowledge that Brad Edwards ever participated in the Ponzi scheme.

- Question not answered: "Specifically what are the allegations against you which you contend Mr. Edwards ginned up?" Reasonable inference: No allegations against Epstein were ginned up.

- Question not answered: "Well, which of Mr. Edwards' cases do you contend were fabricated?" Reasonable inference: No cases filed by Edwards against Epstein were fabricated.

- Question not answered: "Did sexual assaults ever take place on a private airplane on which you were a passenger?" Reasonable inference: Epstein was on a private airplane while sexual assaults were taking place.

- Question not answered: "How many minors have you procured for prostitution?" Reasonable inference: Epstein has procured multiple minors for prostitution.

- Question not answered: "Is there anything in L.M.'s Complaint that was filed against you in September of 2008 which you contend to be false?" Reasonable inference: Nothing in L.M.'s complaint filed in September of 2008 was false – i.e., as alleged in L.M.'s complaint, Epstein repeatedly sexually assaulted her while she was a minor and she was entitled to substantial compensatory and punitive damages as a result.

- Question not answered: "I would like to know whether you ever had any physical contact with the person referred to as Jane Doe in that [federal] complaint?" Reasonable inference: Epstein had physical contact with minor Jane Doe as alleged in her federal complaint.

- Question not answered: "Did you ever have any physical contact with E.W.?" Reasonable inference: Epstein had physical contact with minor E.W. as alleged in her complaint.

- Question not answered: "What is the actual value that you contend the claim of E.W. against you has?" Reasonable inference: E.W.'s claim against Epstein had substantial actual value.

  (See Exhibit "A" – Edwards' Statement of Undisputed Material Facts, paragraphs 93-120 for page references.)

A jury could conclude, therefore, from the adverse inferences drawn against Epstein that he was liable for the claims brought by Brad Edwards and that he had no basis for the pursuit of his efforts to intimidate and extort Edwards and his clients in the pursuit of those claims.

<u>The Litigation Privilege Does Not Bar the Claims of Abuse of Process and Malicious Prosecution</u>

Epstein contends he is entitled to absolute immunity pursuant to the litigation privilege as to both claims asserted by Edwards because all actions taken by him occurred during the litigation of his abuse of process claim against Edwards. For support, he relies primarily on the decision of *Wolfe v. Foreman*, 2013 WL 3724763 (Fla. 3d DCA July 17, 2013), wherein the Third District found that the litigation privilege barred both an abuse of process claim and a malicious prosecution cause of action. *Wolfe* is still

on rehearing and, thus, is not a final opinion. As a result, it is not binding, nor persuasive. Moreover, *Wolfe* undercuts the long-standing recognition of the viability of a claim for malicious prosecution in its own District and other Florida state and federal courts. *See, SCI Funeral Svs. of Fla., Inc. v. Henry*, 839 So. 2d 702, n.4 (Fla. 3d DCA 2002) ("As the *Levin* court cited *Wright v. Yurko*, 446 So. 2d 1162, 1165 (Fla. 5th DCA, 1984), with approval, presumably the cause of action for malicious prosecution continues to exist and would not be barred by the litigation privilege."); *Boca Investors Group, Inc. v. Potash*, 835 So. 2d 273, 275 (Fla. 3d DCA 2002) (Cope, J., concurring) (litigation privilege would not be a bar to a malicious prosecution action); *North Star Capital Acquisitions, LLC v. Krig*, 611 Fed. Supp. 2d 1324 (M.D. Fla. 2009) ("However, not every event bearing any relation to litigation is protected by the privileged because,... "if the litigation privilege applied to all actions preliminary to or during judicial proceedings, an abuse of process claim would never exist, nor would a claim for malicious prosecution"); *Cruz v. Angelides*, 574 So. 2d 278 (Fla. 3d DCA 1991)("the law is well settled that a witness in a judicial proceeding,... is absolutely immune from any civil liability, save perhaps malicious prosecution, for testimony or other sworn statements which he or she gives in the course of the subject proceeding."); *Johnson v. Libow*, 2012 WL 4068409 (Fla. 15th Jud. Cir. March 1, 2012)(the purpose of the litigation privilege does not preclude the tort of malicious prosecution).

In *Wright v. Yurko supra,* the Fifth District Court of Appeal rejected the application of the litigation privilege to a malicious prosecution action brought by a physician against his patients and an expert after he successfully defended a malpractice claim. Also of significance is the Second District's opinion in *Olson v. Johnson,* 961 So. 2d 351 (Fla. 2d DCA 2007). In that case, the court observed that the litigation (or judicial) privilege would not apply to bar a malicious prosecution action which arose as a result of a false accusation of criminal liability where the prosecution was based, in part, on the testimony of the defendants in the criminal case. The court ruled that the privilege (either absolute or qualified)

which might otherwise apply to a defamation claim for statements made during the course of a judicial proceeding did not bar a malicious prosecution claim.

In light of the implicit recognition by the Supreme Court in *Levin* that a claim of malicious prosecution is not barred by the litigation privilege – an implicit recognition acknowledged by the Third District itself – Epstein's reliance on *Wolfe* is misplaced. *Wolfe* is also factually distinguishable from Edwards' claims against Epstein. *Wolfe* involved a malicious prosecution action against attorneys. Separate policy considerations might serve to impose additional limitations on the assertion of malicious prosecution claims against attorneys – against whom alternative remedies exist such as bar disciplinary proceedings. *See Taylor v. McNichols*, 243 P.2d 642 (Idaho 2010). Moreover, in light of the decisions in *Wright v. Yurko, supra* and *Olson v. Johnson, supra*, the weight of authority supports the proposition that the litigation privilege would not apply to malicious prosecution claims.

Both the Third and Fourth Districts have applied the litigation privilege to abuse of process claims. However, *Wolfe* itself, and the decisions of the Third and Fourth Districts cited in Wolfe, involved the litigation privilege as applied to claims of abuse of process by attorneys. None of the cases involved the extraordinary actions of an individual party like Epstein who carried out a course of action against Plaintiff's counsel with a singular purpose unrelated to any legitimate judicial goal. Under the compelling facts of this case, where the actions of Epstein are coupled with the elements of malice and absence of probable cause arising from the unfounded filing of the claims against Edwards, the litigation privilege should not have any applicability to the abuse of process claim asserted by Edwards.

<u>There are Disputed Issues of Fact Precluding Summary Judgment on the Abuse of Process Claim</u>

An abuse of process claim requires pleading and proof of the following three elements: 1) that the defendant made an illegal, improper or perverted use of process; 2) that the defendant had ulterior motives or purposes in exercising such illegal, improper, or perverted use of process; and 3) that, as a result of such action on the part of the defendant, the plaintiff suffered damage." *See S&I Invs. v. Payless*

Flea Mkt., 36 So. 3d 909, 917 (Fla. 4th DCA 2010)(citation omitted). The case law is clear that on an abuse of process claim a "plaintiff must prove that the process was used for an immediate purpose other than that for which it was designed." *Id.* (citation omitted). Where the actions taken by a party in a particular lawsuit are designed to coerce another into taking some collateral action not properly involved in the proceeding a claim of abuse of process is stated. *Miami Herald Publishing Company v. Ferre,* 8636 F. Supp. 970 (S.D. Fla. 1985).

In a case for abuse of process, the question of whether the plaintiff's case satisfies the requisite elements is largely a question for a jury. *See* Patrick John McGinley, 21 Fla. Prac., Elements of an Action § 50:1 (2013-2014 ed.)(citing *Gatto v. Publix Supermarket, Inc.*, 387 So. 2d 377 (Fla. 3d DCA 1980)).

The usual case of abuse of process involves some form of extortion. *Scozari v. Barone*, 546 So. 2d 750, 751(Fla. 3d DCA 1989) (citing *Bothmann v. Harrington,* 458 So. 2d 1163, 1169 (Fla. 3d DCA 1984)). That is *exactly* what has transpired here. Epstein employed the extraordinary financial resources at his disposal to intimidate his molestation victims and Edwards into abandoning their legitimate claims or resolving those claims for substantially less than their just and reasonable value. Consequently, since Epstein's sole purpose and ulterior motive for filing the complaint without probable cause was in an effort to extort, to wit: to force his molestation victims and Edwards to settle for minimal amounts, that filing and everything subsequently done to pursue the claims constitutes an abuse of process. *See* Exhs. A at 18-27, C at 4-7. Because Edwards has conclusively demonstrated that Epstein's actions in pursuing his claims were designed to coerce Edwards (and his client) to take some collateral action not properly involved in the proceedings and did so with an ulterior purpose, summary judgment directed at the abuse of process claim must fail. The damages suffered by Edwards include: (a) injury to his reputation; (b) mental anguish, embarrassment and anxiety; (c) fear physical injury to himself and members of his family; (d) the loss of the value of his time required to be diverted from his professional responsibility; and (e) the cost of defending against Epstein's spurious and baseless claims. All the elements of the

claim for abuse of process have been satisfied. This case, then, falls within the parameters of the Third District's Decision in *Scozari v. Barone, supra* in which the court reversed the entry of summary judgment for the defendant on claims of malicious prosecution and abuse of process. With respect to the abuse of process claim, the court stated that "if there was no reasonable basis in law and fact to bring the action to impress a lien on property, and this was done without any reasonable justification under law and to force or compel the appellant to resolve some custody dispute, induce the appellant to pay money, or tie up the appellant's property, then there has been an abuse of process." *Id* at 752.

<u>There are Disputed Issues of Fact Precluding Summary Judgment on the Claim of Malicious Prosecution</u>

Here, Epstein's voluntary dismissal of his abuse of process claims against Edwards amounted to a bona fide termination of the proceedings. He knew his allegations were unsupported by evidence (See discussion above at pages 3-6). Knowing he lacked *any* verifiable evidence against Edwards, on the eve of the summary judgment hearing, Epstein effectively conceded that fact by voluntarily dismissing his claims. Hence, it is evident that Epstein took voluntary dismissal of his claims because he knew he did not have probable cause or an evidentiary basis to support the allegations. *See Cohen v. Corwin*, 980 So. 2d 1153 at 1156 (citing *Union Oil of California, Amsco Division v. Watson,* 468 So. 2d 349 at 354 (stating that "where a dismissal is taken because of insufficiency of the evidence, the requirement of a favorable termination is met")). Accordingly, the manner of termination reflects on the merits of the case and there was a bona fide termination of Epstein's civil proceeding against Edwards (See Judge Crow's Order of March 29, 2012 denying Motion to Dismiss re: Issue of Bonafide Termination attached as Exhibit "H").

Epstein's only other issue with Edwards' counterclaim for malicious prosecution is that he did not lack probable cause in pursing his claims against Edwards. As established by the record, Epstein did, in fact, lack probable cause to assert his claims against Edwards (See discussion above). Epstein's purported

reliance on public filings, including the Scherer Complaint against Rothstein is unavailing. As discussed above, the evidence warrants the finding that Epstein knew that Edwards was legitimately pursuing the claims on behalf of his clients which included the effort to secure testimony from Epstein's close confidants. Therefore, Epstein cannot rely upon the referenced public documents to support his claims against Edwards given that he knows that information to be untrue and he refuses to answer questions about the veracity of the information. *See* Exh. G at pgs. 53:6-24; 78:16-24; 87:20-88:14. Consequently, Epstein had no good faith basis to rely on such information.

Epstein's Assertion of his Fifth Amendment Privilege Gives Rise to Adverse Inferences Pertinent to His Motion for Summary Judgment and Precludes His Reliance on Purported Undisputed Facts

As discussed above, Epstein's multiple invocations of his Fifth Amendment Privilege results in adverse inferences which directly impact the issues advanced in his Motion for Summary Judgment. "It is well settled that the Fifth Amendment does not forbid adverse inferences against parties to civil actions when they refuse to testify in response to probative evidence offered against them." *Baxter v. Palmigiano,* 425 U.S. 308, 318 (1976); *Accord, Vasquez v. State,* 777 So. 2d 1200, 1203 (Fla. at 2001). The reason for this rule "is both logical and utilitarian. A party may not trample upon the rights of others and then escape the consequences by invoking a constitutional privilege – at least not in a civil setting." *Fraser v. Security and INV. Corp,* 615 So. 2d. 841, 842 (Fla. 4th DCA 1993). The adverse inferences drawn from Epstein's assertion of the Fifth Amendment undercut his claim of justifiable reliance based upon the purported undisputed material facts to support his Motion for Summary Judgment.

Moreover, because Epstein elected to hide behind the shield of his right against self-incrimination to preclude his disclosing <u>any</u> relevant information about the criminal activity at the center of his claims, he was effectively barred from prosecuting his abuse of process claim against Edwards. Similarly, Epstein should be barred from utilizing the Fifth Amendment privilege to secure summary judgment based upon assertions of fundamental facts when Epstein refused to testify on essential issues pertinent to the

arguments advanced in support of his Motion for Summary Judgment. Under the well-established "sword and shield" doctrine, Epstein could not seek damages from Edwards while at the same time asserting a Fifth Amendment privilege to block relevant discovery. *See* Exhs. B at 14-21, C at 18-25, G at 53:6-24; 78:16-24; 87:20-88:14. The same policies which underlie the sword and shield doctrine as applied to the recovery of affirmative relief should also apply to attempts to advance positions with respect to a Motion for Summary Judgment which would have the effect of securing relief against certain claims.

"[T]he law is well settled that a plaintiff is not entitled to both his silence and his lawsuit." *Boys & Girls Clubs of Marion County, Inc. v. J.A.*, 22 So. 3d 855, 856 (Fla. 5th DCA 2009)(Griffin, J., concurring specially). Thus, "a person may not seek affirmative relief in a civil action and then invoke the fifth amendment to avoid giving discovery, using the fifth amendment as both a 'sword and a shield.'" *DePalma v. DePalma,* 538 So. 2d 1290, 1290 (Fla. 4th DCA 1989)(quoting *DeLisi v. Bankers Insurance Co.,* 436 So. 2d 1099 (Fla. 4th DCA 1983)). Put another way, "[a] civil litigant's fifth amendment right to avoid self-incrimination may be used as a shield but not a sword. This means that a plaintiff seeking affirmative relief in a civil action may not invoke the fifth amendment and refuse to comply with the defendant's discovery requests, thereby thwarting the defendant's defenses." *Rollins Burdick Hunter of New York, Inc. v. Euroclassic Limited, Inc.,* 502 So. 2d 959 (Fla. 3d DCA 1983).. For the same reasons, Epstein should be precluded from advancing arguments based on purported statements of undisputed fact which cannot be effectively challenged in light of his assertion of the Fifth Amendment. Epstein has done precisely what well-established law prohibits.

Conclusion

Based upon the foregoing, the Defendant, Counter-Plaintiff, Bradley Edwards respectfully submits that Jeffrey Epstein's Motion for Summary Judgment must be denied.

I HEREBY CERTIFY that a true and correct copy of the foregoing was sent via E-Serve to all Counsel on the attached list, this 17th day of January, 2014.

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IN THE CIRCUIT COURT OF THE 15TH JUDICIAL CIRCUIT IN AND FOR PALM BEACH COUNTY, FLORIDA

Case No.:50 2009 CA 040800XXXXMBAG

JEFFREY EPSTEIN,

Plaintiff,

vs.

SCOTT ROTHSTEIN, individually, and
BRADLEY J. EDWARDS, individually,

Defendants,
_____/

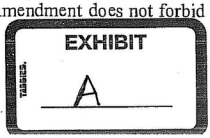
STATEMENT OF UNDISPUTED FACTS

Defendant Bradley J. Edwards, Esq., offers the following specific facts as the undisputed material facts in this case. Each of the following facts is numbered separately and individually to facilitate Epstein's required compliance with Fla. R. Civ. P. 1.510(c) ("The adverse party shall identify . . . any summary judgment evidence on which the adverse party relies."). All referenced exhibits and attachments have previously been filed with the Court and provided to Epstein.

Sexual Abuse of Children By Epstein

1. Defendant Epstein has a sexual preference for young children. Deposition of Jeffrey Epstein, Mar. 17, 2010, at 110 (hereinafter "Epstein Depo.") (Deposition Attachment #1).[1]

[1] When questioned about this subject at his deposition, Epstein invoked his Fifth Amendment right to remain silent rather than make an incriminating admission. Accordingly, Edwards is entitled to the adverse inference against Epstein that, had Epstein answered, the answer would have been unfavorable to him. "[I]t is well-settled that the Fifth Amendment does not forbid adverse inferences against parties to



2. Epstein repeatedly sexually assaulted more than forty (40) young girls on numerous occasions between 2002 and 2005 in his mansion in West Palm Beach, Florida. These sexual assaults included vaginal penetration. Epstein abused many of the girls dozens if not hundreds of times. Epstein Depo. at 109 ("Q: How many times have you engaged in oral sex with females under the age of 18?" A: [Invocation of the Fifth Amendment]); Deposition of Jane Doe, September 24, 2009 and continued March 11, 2010, at 527 (minor girl sexually abused at least 17 times by Epstein) (hereinafter "Jane Doe Depo") (Deposition Attachment #2); *id.* 564-67 (vaginal penetration by Epstein with his finger), 568 (vaginal penetration by Epstein with a massager); Deposition of L.M., September 24, 2009, at 73 (hereinafter "L.M. Depo") (Deposition Attachment #3) (describing the manner in which Epstein abused her beginning when LM was 13 years old, touching her vagina with his fingers and vibrator) at 74, line 12-13 (she was personally molested by Epstein more than 50 times), at 164, line 19-23 and 141, line 12-13 and 605, line 3-6 (describing that in addition to being personally molested by Epstein she was paid $200 per underage girl she brought Epstein and she brought him more than seventy (70) underage girls - she told him that she did not want to bring him any more girls and he insisted that she continue to bring him underage girls); Deposition of E.W., May 6, 2010 (hereinafter "E.W. Depo") (Deposition Attachment #4) at 115-116, 131 and 255 (describing Epstein's abuse of her beginning at age 14 when he paid her for touching her vagina, inserting his fingers and

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civil actions when they refuse to testify in response to probative evidence offered against them." *Baxter v. Palmigiano,* 425 U.S. 308, 318 (1976); *accord Vasquez v. State*, 777 So.2d 1200, 1203 (Fla. App. 2001). The reason for this rule "is both logical and utilitarian. A party may not trample upon the rights of others and then escape the consequences by invoking a constitutional privilege – at least not in a civil setting." *Fraser v. Security and Inv. Corp.*, 615 So.2d 841, 842 (Fla. App. 1993).

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using a vibrator and he also paid her $200 for each other underage female E.W. brought him to molest. She brought him between 20 and 30 underage females); Deposition of Jane Doe #4, date (hereinafter "Jane Doe #4 Depo") (Deposition Attachment #5) at 32-34, and 136 (she describes first being taken to Epstein at 15 years old, "Being fingered by him, having him use a vibrator on [me], grabbing my nipples, smelling my butt, jerking off in front of me, licking my clit, several times.").

3. At all relevant times Edwards has had a good faith basis to conclude and did conclude[2] that Epstein was able to access a large number of underage girls through a pyramid abuse scheme in which he paid underage victims $200-$300 cash for each other underage victim that she brought to him. *See* Palm Beach Police Incident Report at 87 (hereinafter "Incident Report") (Exhibit "A").[3] The Palm Beach Police Incident Report details Epstein's scheme for molesting underage females. Among other things, the Incident Report outlines some of the experiences of other Epstein victims. When S.G, a 14 year old minor at the time, was brought to Epstein's home, she was taken upstairs by a woman she believed to be Epstein's assistant. The woman started to fix up the room, putting covers on the massage table and bringing lotions out. The "assistant" then left the room and told S.G. that Epstein would be up in a second. Epstein walked over to S.G. and told her to take her clothes off in a stern voice. S.G. states in the report she did not know what to do, as she was the only one there. S.G. took off her shirt, leaving her bra on. Epstein, then in a towel told her to take off everything. S.G. removed her pants leaving

[2] In support of all assertions concerning the actions Edwards took, what Edwards learned in the course of his representation of his clients, Edwards's good faith beliefs and the foundation for those beliefs, see Edwards Affidavit and specifically paragraphs 25 and 25 of that Affidavit.

[3] For clarity, depositions attached to this memorandum will be identified numerically as attachments #1, #2, #3, etc., while exhibits attached to this memorandum will be identified alphabetically as exhibits A, B, C, etc.

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on her thong panties. Epstein then instructed S.G to give him a massage. As S.G gave Epstein a massage, Epstein turned around and masturbated. S.G. was so disgusted, she did not say anything; Epstein told her she "had a really hot body." *Id.* at 14. In the report, S.G. admitted seeing Jeffrey Epstein's penis and stated she thought Epstein was on steroids because he was a "really built guy and his wee wee was very tiny." *Id. at* 15.

4. The exact number of minor girls who Epstein assaulted is known only to Epstein. However, Edwards had a good faith basis to believe and did in fact believe that Epstein's victims were substantially more than forty (40) in number. In addition to the deposition excerpts from two of his many victims above about the number of underage girls brought to Epstein and the Palm Beach incident report, there is overwhelming proof that the number of underage girls molested by Epstein through his scheme was in the hundreds. *See* Complaint, Jane Doe 102 v. Epstein, (hereinafter Jane Doe 102 complaint) (Exhibit "B"); *see also* Deposition of Jeffrey Epstein, April 14, 2010, at 442, 443, and 444 (Epstein invoking the 5th on questions about his daily abuse and molestation of children) (Deposition Attachment #6).

5. At all relevant times Edwards has had a good faith basis to believe and did in fact believe that Epstein and his attorneys knew of the seriousness of the criminal investigation against him and corresponded constantly with the United States Attorney's Office in an attempt to avoid the filing of numerous federal felony offenses, which effort was successful. *See* Correspondence from U.S. Attorney's Office to Epstein (hereinafter "U.S. Attorney's Correspondence") (Composite Exhibit "C) (provided in discovery during the Jane Doe v. Epstein case).

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6. At all relevant times Edwards has had a good faith basis to believe and did in fact believe that, more specifically, Epstein's attorneys knew of Epstein's scheme to recruit minors for sex and also knew that these minors had civil actions that they could bring against him. In fact, there was much communication between Epstein's attorneys and the United States Prosecutors in a joint attempt to minimize Epstein's civil exposure. For example, on October 3, 2007, Assistant U.S. Attorney Marie Villafaña sent an email (attached hereto as Exhibit "D") to Jay Lefkowitz, counsel for Epstein, with attached proposed letter to special master regarding handling numerous expected civil claims against Epstein. The letter reads in pertinent part,

> "The undersigned, as counsel for the United States of America and Jeffrey Epstein, jointly write to you to provide information relevant to your service as a Special Master in the selection of an attorney to represent several young women who may have civil damages claims against Mr. Epstein. The U.S. Attorney's Office and the Federal Bureau of Investigation (jointly referred to as the "United States") have conducted an investigation of Jeffrey Epstein regarding his solicitation of minor females in Palm Beach County to engage in prostitution. Mr. Epstein, through his assistants, would recruit underage females to travel to his home in Palm Beach to engage in lewd conduct in exchange for money. Based upon the investigation, the United States has identified forty (40) young women who can be characterized as victims pursuant to 18 USC 2255. Some of those women went to Mr. Epstein's home only once, some went there as much as 100 times or more. Some of the women's conduct was limited to performing a topless or nude massage while Mr. Epstein masturbated himself. For other women, the conduct escalated to full sexual intercourse. As part of the resolution of the case, Epstein has agreed that he would not contest jurisdiction in the Southern District of Florida for any victim who chose to sue him for damages pursuant to 18 USC 2255. Mr. Epstein agreed to provide an attorney for victims who elected to proceed exclusively pursuant to that section, and agreed to waive any challenge to liability under that section up to an amount agreed to by the parties. The parties have agreed to submit the selection of an attorney to a Special Master...."

7. At all relevant times Edwards has had a good faith basis to believe and did in fact believe that L.M. was, in fact, a victim of Epstein's criminal abuse because L.M. was one of the

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minor females that the United States Attorney's Office recognized as a victim. L.M.'s sworn deposition testimony and the adverse inference drawn from Epstein's refusal to testify confirm that Epstein began sexually assaulting L.M. when she was 13 years old and continued to molest her on more than fifty (50) occasions over three (3) years. Epstein Depo., Attachment #1, at 17 ("Q: Did you . . . ever engage in any sexual conduct with L.M.?" A: [Invocation of the Fifth Amendment].); *see also* Epstein Depo., April 14, 2010, Attachment #6, at 456 ("Q: LM was an underage female that you first abused when she was 13 years old; is that correct?" A: [Invocation of Fifth Amendment].)

8. Epstein was also given ample opportunity to explain why he engaged in sexual activity with L.M. beginning when L.M. was 13 years old and why he has molested minors on an everyday basis for years, and he invoked his 5th amendment right rather than provide explanation. *See* Epstein Deposition, February 17, 2010, at 11-12, 30-31 (Deposition Attachment # 7).

9. Epstein also sexually assaulted E.W., beginning when she was 14 years old and did so on numerous occasions. *See* E.W. Depo., Attachment #4 at 215-216.

10. Another of the minor girls Epstein sexually assaulted was Jane Doe; the abuse began when Jane Doe was 14 years old. Rather than incriminate himself, Epstein invoked the 5th amendment to questions about him digitally penetrating Doe's vagina, using vibrators on her vagina and masturbating and ejaculating in her presence. Epstein Depo., April 14, 2010, Attachment #6, at 420, 464, 468.

11. When Edwards's clients L.M., E.W., and Jane Doe were 13 or 14 years old, each was brought to Epstein's home multiple times by another underage victim. Epstein engaged in

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one or more of the following acts with each of the then-minor girls at his mansion: receiving a topless or completely nude massage; using a vibrator on her vagina; masturbating in her presence; ejaculating in her presence; touching her breast or buttocks or vagina or the clothes covering her sexual organs; and demanding that she bring him other underage girls. Epstein and his co-conspirators used the telephone to contact these girls to entice or induce them into going to his mansion for sexual abuse. Epstein also made E.W. perform oral sex on him and was to perform sex acts on Nadia Marcinkova (Epstein's live-in sex slave) in Epstein's presence. *See* Plaintiff Jane Doe's Notice Regarding Evidence of Similar Acts of Sexual Assault, filed in Jane Doe v. Epstein, No. 08-cv-80893 (S.D. Fla. 2010), as DE 197, (hereinafter "Rule 413 Notice") (Exhibit "E"); Jane Doe Depo., Attachment #2, at 379-380; L.M. Depo., Attachment #3, at 416; E.W. Depo, Attachment #4, at 205.

12. At all relevant times Edwards has had a good faith basis to believe and did in fact believe that yet another of the minor girls Epstein sexually assaulted was C.L. When she was approximately 15 years old, C.L. was brought to Epstein's home by another underage victim. While a minor, she was at Epstein's home on multiple occasions. Epstein engaged in one or more of the following acts with her while she was a minor at his house - topless or completely nude massage on Epstein; Epstein used a vibrator on her vagina; Epstein masturbated in her presence; Epstein ejaculated in her presence; Epstein also demanded that she bring him other underage girls. *See* Rule 413 Notice, Exhibit "E"; Incident Report, Exhibit "A."

13. At all relevant times Edwards has had a good faith basis to believe and did in fact believe that yet another girl Epstein sexually assault was A.H. When she was approximately 16 years old, she was brought to Epstein's home by another underage victim. While a minor, she

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was at Epstein's home on multiple occasions. Epstein engaged in one or more of the following acts with her while she was a minor at his house - topless or completely nude massage on Epstein; Epstein used a vibrator on her vagina; Epstein masturbated in her presence; Epstein ejaculated in her presence; Epstein touched her breast or buttock or vagina or the clothes covering her sexual organs; was made to perform sex acts on Epstein; made to perform sex acts on Nadia Marcinkova in Epstein's presence. Epstein also forcibly raped this underage victim, as he held her head down against her will and pumped his penis inside her while she was screaming "No". *See* Rule 413 Notice, Exhibit "E"; Incident Report, Exhibit "A", at 41 (specifically discussing the rape):

> "[A.H.] remembered that she climaxed and was removing herself from the massage table. [A.H.] asked for a sheet of paper and drew the massage table in the master bathroom and where Epstein, Marcinkova and she were. Epstein turned [A.H.] on to her stomach on the massage bed and inserted his penis into her vagina. [A.H.] stated Epstein began to pump his penis in her vagina. [A.H.] became upset over this. She said her head was being held against the bed forcibly, as he continued to pump inside her. She screamed no, and Epstein stopped ...."

> "[A.H.] advised there were times that she was so sore when she left Epstein's house. [A.H.] advised she was ripped, torn, in her vagina area. [A.H.] advised she had difficulty walking to the car after leaving the house because she was so sore."

14. Without detailing each fact known about Epstein's abuse of the many underage girls, Edwards has had a good faith basis to believe and did in fact believe at all relevant times that Epstein also abused other victims in ways closely similar to those described in the preceding paragraphs. Epstein's additional victims include the following (among many other) young girls: S.G.; A.D.; V.A.; N.R.; J.S.; V.Z.; J.A.; F.E.; M.L.; M.D.; D.D.; and D.N. These girls were between the ages of 13 and 17 when Epstein abused them. *See* Rule 413 Notice, Exhibit E; Deposition of E.W., Deposition Attachment #4.

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15. One of Mr. Epstein's household employees, Mr. Alfredo Rodriguez, saw numerous underage girls coming into Epstein's mansion for purported "massages." *See* Rodriguez Depo. at 242-44 (Deposition Attachment #8). Rodriguez was aware that "sex toys" and vibrators were found in Epstein's bedroom after the purported massages. *Id.* at 223-28. Rodriguez thought what Epstein was doing was wrong, given the extreme youth of the girls he saw. *Id.* at 230-31..

16. Alfredo Rodriguez took a journal from Epstein's computer that reflected many of the names of underage females Epstein abused across the country and the world, including locations such as Michigan, California, West Palm Beach, New York, New Mexico, and Paris, France. *See* Journal (hereinafter "The Journal" or "Holy Grail") (Exhibit "F") (identifying, among other Epstein acquaintances, females that Rodriguez believes were underage under the heading labeled "Massages").

17. Rodriguez was later charged in a criminal complaint with obstruction of justice in connection with trying to obtain $50,000 from civil attorneys pursuing civil sexual assault cases against Epstein as payment for producing the book to the attorneys. *See* Criminal Complaint at 2, U.S. v. Rodriguez, No. 9:10-CR-80015-KAM (S.D. Fla. 2010) (Exhibit "G"). Rodriguez stated he needed money because the journal was his "property" and that he was afraid that Jeffrey Epstein would make him "disappear" unless he had an "insurance policy" (i.e., the journal). *Id.* at 3. Because of the importance of the information in the journal to the civil cases, Mr. Rodriguez called it "The Holy Grail."

18. In the "Holy Grail" or "The Journal," among the many names listed (along with the abused girls) are some of the people that Epstein alleges in his Complaint had "no connection

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whatsoever" with the litigation in this case. *See, e.g.,* Journal, Exhibit F, at 85 (Donald Trump); at 9 (Bill Clinton phone numbers listed under "Doug Bands").

Federal Investigation and Plea Agreement With Epstein

19. In approximately 2005, the FBI and the U.S. Attorney's Office in the Southern District of Florida learned of Epstein's repeated sexual abuse of minor girls. They began a criminal investigation into federal offenses related to his crimes. *See* U.S. Attorney's Correspondence, Exhibit "C".

20. At all relevant times Edwards has had a good faith basis to believe and did in fact believe that to avoid the Government learning about his abuse of minor girls, Epstein threatened his employees and demanded that they not cooperate with the government. Epstein's aggressive witness tampering was so severe that the United States Attorney's Office prepared negotiated plea agreements containing these charges. For example, in a September 18, 2007, email from AUSA Villafaña to Lefkowitz (attached hereto as Exhibit "H"), she attached the proposed plea agreement describing Epstein's witness tampering as follows:

"UNITED STATES vs. JEFFREY EPSTEIN PLEA PROFFER"

> On August 21, 2007, FBI Special Agents E. Nesbitt Kuyrkendall and Jason Richards traveled to the home of Leslie Groff to serve her with a federal grand jury subpoena with an investigation pending in the Southern District of Florida. Ms. Groff works as the personal assistant of the defendant. Ms. Groff began speaking with the agents and then excused herself to go upstairs to check on her sleeping child. While upstairs, Ms. Groff telephoned the defendant, Jeffrey Epstein, and informed him that the FBI agents were at her home. Mr. Epstein instructed Ms. Groff not to speak with the agents and reprimanded her for allowing them into her home. Mr. Epstein applied pressure to keep Ms. Groff from complying with the grand jury subpoenas that the agents had served upon her. In particular, Mr. Epstein warned Ms. Groff against turning over documents and electronic evidence responsive to the subpoena and pressured her to delay her

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appearance before the grand jury in the Southern District of Florida. This conversation occurred when Mr. Epstein was aboard his privately owned civilian aircraft in Miami in the Southern District of Florida. His pilot had filed a flight plan showing the parties were about to return to Teterboro, NJ. After the conversation with Ms. Groff, Mr. Epstein became concerned that the FBI would try to serve his traveling companion, Nadia Marcinkova, with a similar grand jury subpoena. In fact, the agents were preparing to serve Ms. Marcinkova with a target letter when the flight landed in Teterboro. Mr. Epstein then redirected his airplane, making the pilot file a new flight plan to travel to the US Virgin Islands instead of the New York City area, thereby keeping the Special Agents from serving the target letter on Nadia Marcinkova. During the flight, the defendant verbally harassed Ms. Marcinkova, harassing and pressuring her not to cooperate with the grand jury's investigation, thereby hindering and dissuading her from reporting the commission of a violation of federal law to a law enforcement officer, namely, Special Agents of the FBI. Epstein also threatened and harassed Sarah Kellen against cooperating against him as well.

21. Edwards learned that the Palm Beach police department investigation ultimately led to the execution of a search warrant at Epstein's mansion in October 2005. *See* Police Incident Report, Exhibit "A".

22. Edwards learned that at around the same time, the Palm Beach Police Department also began investigating Epstein's sexual abuse of minor girls. They also collected evidence of Epstein's involvement with minor girls and his obsession with training sex slaves, including pulling information from Epstein's trash. Their investigation showed that Epstein ordered from Amazon.com on about September 4, 2005, such books as: SM101: A Realistic Introduction, by Jay Wiseman; SlaveCraft: Roadmaps for Erotic Servitude - Principles, Skills, and Tools, by Guy Baldwin; and Training with Miss Abernathy: A Workbook for Erotic Slaves and Their Owners, by Christina Abernathy. *See* Receipt for Sex Slave Books (Exhibit "I").

23. The Palm Beach incident reports provided Edwards with the names of numerous witnesses that participated in Epstein's child molestation criminal enterprise and also provided

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Edwards with some insight into how far-reaching Epstein's power was and how addicted Epstein was to sex with children. *See* Incident Report, Exhibit "A".

24. The Palm Beach Police Department also collected Epstein's message pads, which provided other names of people that also knew Epstein's scheme to molest children. *See* Message Pads (Exhibit "J") (note: the names of underage females have been redacted to protect the anonymity of the underage sex abuse victims). Those message pads show clear indication that Epstein's staff was frequently working to schedule multiple young girls between the ages of 12 and 16 years old literally every day, often two or three times per day. *Id.*

25. In light of all of the information of numerous crimes committed by Epstein, Edwards learned that the U.S. Attorney's Office began preparing the filing of federal criminal charges against Epstein. For example, in addition to the witness tampering and money laundering charges the U.S. Attorney's Office prepared an 82-page prosecution memo and a 53-page indictment of Epstein related to his sexual abuse of children. On September 19, 2007, at 12:14 PM, AUSA Villafaña wrote to Epstein's counsel, Jay Lefkowitz, "Jay - I hate to have to be firm about this, but we need to wrap this up by Monday. I will not miss my indictment date when this has dragged on for several weeks already and then, if things fall apart, be left in a less advantageous position than before the negotiations. I have had an 82-page pros memo and 53-page indictment sitting on the shelf since May to engage in these negotiations. There has to be an ending date, and that date is Monday." These and other communications are within the correspondence attached as Composite Exhibit "C."

26. Edwards learned that rather than face the filing of federal felony criminal charges, Epstein (through his attorneys) engaged in plea bargain discussions. As a result of those

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discussions, on September 24, 2007, Epstein signed an agreement with the U.S. Attorney's Office for the Southern District of Florida. Under the agreement, Epstein agreed to plead guilty to an indictment pending against him in the 15th Judicial Circuit in and for Palm Beach County charging him with solicitation of prostitution and procurement of minors for prostitution. Epstein also agreed that he would receive a thirty month sentence, including 18 months of jail time and 12 months of community control. In exchange, the U.S. Attorney's Office agreed not to pursue any federal charges against Epstein. *See* Non-Prosecution Agreement (Exhibit "K").

27. Part of the Non-Prosecution Agreement that Epstein negotiated was a provision in which the federal government agreed not to prosecute Epstein's co-conspirators. The co-conspirators procured minor females to be molested by Epstein. One of the co-conspirators - Nadia Marcinkova -even participated in the sex acts with minors (including E.W.) and Epstein. *See* Incident Report, Exhibit "A", at 40-42, 49-51; Deposition of Nadia Marcinkova, April 13, 2010, (hereinafter "Marcinkova Depo.") at 11 (Deposition attachment #9).

28. Under the Non-Prosecution Agreement, Epstein was to use his "best efforts" to enter into his guilty pleas by October 26, 2007. However, Edwards learned that Epstein violated his agreement with the U.S. Attorney's Office to do so and delayed entry of his plea. *See* Letter from U.S. Attorney R. Alexander Acosta to Lilly Ann Sanchez, Dec. 19, 2007 (Exhibit "L").

29. On January 10, 2008 and again on May 30, 2008 E.W. and L.M. received letters from the FBI advising them that "[t]his case is currently under investigation. This can be a lengthy process and we request your continued patience while we conduct a thorough investigation." Letters attached at Composite Exhibit "M". This document is evidence that the FBI did not notify E.W. and L.M. that a plea agreement had already been reached that would

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block federal prosecution of Epstein. Nor did the FBI notify E.W. and L.M. of any of the parts of the plea agreement. Nor did the FBI or other federal authorities confer with E.W. and L.M. about the plea. *See id.*

30. In 2008, Edwards believed in good faith that criminal prosecution of Epstein was extremely important to his clients E.W. and L.M. and that they desired to be consulted by the FBI and/or other representatives of the federal government about the prosecution of Epstein. The letters that they had received around January 10, 2008, suggested that a criminal investigation of Epstein was on-going and that they would be contacted before the federal government reached any final resolution of that investigation. *See id.*

Edwards Agrees to Serve as Legal Counsel for Three Victims of Epstein's Sexual Assaults

31. In about April 2008, Bradley J. Edwards, Esq., was a licensed attorney in Florida, practicing as a sole practitioner. As a former prosecutor, he was well versed in civil cases that involved criminal acts, including sexual assaults. Three of the many girls Epstein had abused – L.M., E.W., and Jane Doe – all requested that Edwards represent them civilly and secure appropriate monetary damages against Epstein for repeated acts of sexual abuse while they were minor girls. Two of the girls (L.M. and E.W.) also requested that Edwards represent them in connection with a concern that the Federal Bureau of Investigation (FBI) and U.S. Attorney's Office might be arranging a plea bargain for the criminal offenses committed by Epstein without providing them the legal rights to which they were entitled (including the right to be notified of plea discussions and the right to confer with prosecutors about any plea arrangement). *See*

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Affidavit of Bradley J. Edwards, Esq. at ¶1 - 2, ¶4 (hereinafter "Edwards Affidavit") (Exhibit "N").

32. On June 13, 2008, attorney Edwards agreed to represent E.W.; on July 2, 2008, attorney Edwards agreed to represent Jane Doe; and, on July 7, 2008, attorney Edwards agreed to represent L.M. in connection with the sexual assaults committed by Epstein and to insure that their rights as victims of crimes were protected in the criminal process on-going against Epstein. Mr. Edwards and his three clients executed written retention agreements. *See id.* at ¶2.

33. In mid June of 2008, Edwards contacted AUSA Villafaña to inform her that he represented Jane Doe #1 and, later, Jane Doe #2. AUSA Villafaña did not advise that a plea agreement had already been negotiated with Epstein's attorneys that would block federal prosecution. To the contrary, AUSA Villafaña mentioned a possible indictment. AUSA Villafaña did indicate that federal investigators had concrete evidence and information that Epstein had sexually molested many underage minor females, including E.W., LM, and Jane Doe. *See id.* at ¶4.

34. Edwards also requested from the U.S. Attorney's Office the information that they had collected regarding Epstein's sexual abuse of his clients. However, the U.S. Attorney's Office, declined to provide any such information to Edwards. It similarly declined to provide any such information to the other attorneys who represented victims of Epstein's sexual assaults. At the very least, this includes the items that were confiscated in the search warrant of Epstein's home, including dildos, vibrators, massage table, oils, and additional message pads. *See* Property Receipt (Exhibit "O").

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35. On Friday, June 27, 2008, at approximately 4:15 p.m., AUSA Villafaña received a copy of Epstein's proposed state plea agreement and learned that the plea was scheduled for 8:30 a.m., Monday, June 30, 2008. AUSA Villafaña called Edwards to provide notice to his clients regarding the hearing. AUSA Villafaña did not tell Attorney Edwards that the guilty pleas in state court would bring an end to the possibility of federal prosecution pursuant to the plea agreement. *See* Edwards Affidavit, Exhibit "N", at ¶6.

36. Under the Crime Victims' Rights Act (CVRA), 18 U.S.C. § 3771, victims of federal crimes – including E.W. and L.M. – are entitled to basic rights during any plea bargaining process; including the right to be treated with fairness, the right to confer with prosecutors regarding any plea, and the right to be heard regarding any plea. The process that was followed leading to the non-prosecution of Epstein violated these rights of E.W. and L.M. *See* Emergency Petn. for Victim's Enforcement of Crime Victim's Rights, No. 9:08-CV-80736-KAM (S.D. Fla. 2008) (Exhibit "P").

37. Because of the violation of the CVRA, on July 7, 2008, Edwards filed an action in the U.S. District Court for the Southern District of Florida, Case No. 9:08-CV-80736, seeking to enforce the rights of E.W. and L.M. That action alleged that the U.S. Attorney's Office had failed to provide E.W. and L.M. the rights to which they were entitled under the Act, including the right to be notified about a plea agreement and to confer with prosecutors regarding it. *See id.*

38. On July 11, 2008, Edwards took E.W. and L.M. with him to the hearing on the CVRA action. It was only at this hearing that both victims learned for the first time that the plea deal was already done with Epstein and that the criminal case against Epstein had been

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effectively terminated by the U.S. Attorney's office. *See* Hearing Transcript, July 11, 2008 (Exhibit "Q").

39. Edwards learned that Jane Doe felt so strongly that the plea bargain was inappropriate that she made her own determination to appear on a television program and exercise her First Amendment rights to criticize the unduly lenient plea bargain Epstein received in a criminal case.

40. The CVRA action that Edwards filed was recently administratively closed and Edwards filed a Motion to reopen that proceeding. *See* No. 9:08-CV-80736 (S.D. Fla.).

Epstein's Entry of Guilty Pleas to Sex Offenses

41. Ultimately, on June 30, 2008, in the Fifteenth Judicial Circuit in Palm Beach County, Florida, defendant Epstein, entered pleas of "guilty" to various Florida state crimes involving the solicitation of minors for prostitution and the procurement of minors for the purposes of prostitution. *See* Plea Colloquy (Exhibit "R").

42. As a condition of that plea, and in exchange for the Federal Government not prosecuting the Defendant, Epstein additionally entered into an agreement with the Federal Government acknowledging that approximately thirty-four (34) other young girls could receive payments from him under the federal statute providing for compensation to victims of child sexual abuse, 18 U.S.C. § 2255. As had been agreed months before, the U.S. Attorney's Office did not prosecute Epstein federally for his sexual abuse of these minor girls. *See* Addendum to Non-Prosecution Agreement (Exhibit "S") (in redacted form to protect the identities of the minors involved).

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43. Because Epstein became a convicted sex offender, he was not to have contact with any of his victims. During the course of his guilty pleas on June 30, 2008, Palm Beach Circuit Court Judge Deborah Dale Pucillo ordered Epstein "not to have any contact, direct or indirect" with any victims. She also expressly stated that her no-contact order applied to "all of the victims." Similar orders were entered by the federal court handling some of the civil cases against Epstein. The federal court stated that it "finds it necessary to state clearly that Defendant is under this court's order not to have direct *or indirect contact* with any plaintiffs . . . ." Order, Case No. 9:08-cv-80119 (S.D. Fla. 2008), [DE 238] at 4-5 (emphasis added); *see also* Order, Case No. 9:08-cv-80893, [DE 193] at 2 (emphasis added).

Edwards Files Civil Suits Against Epstein

44. Edwards had a good faith belief that his clients felt angry and betrayed by the criminal system and wished to prosecute and punish Epstein for his crimes against them in whatever avenue remained open to them. On August 12, 2008, at the request of his client Jane Doe, Brad Edwards filed a civil suit against Jeffrey Epstein to recover damages for his sexual assault of Jane Doe. *See* Edwards Affidavit, "N" at ¶7. Included in this complaint was a RICO count that explained how Epstein ran a criminal conspiracy to procure young girls for him to sexually abuse. *See* Complaint, Jane Doe v. Epstein (Exhibit "T").

45. On September 11, 2008, at the request of his client E.W., Brad Edwards filed a civil suit against Jeffrey Epstein to recover damages for his sexual assault of E.W. *See* Complaint, E.W. v. Epstein (Exhibit "U").

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46. On September 11, 2008, at the request of his client L.M.., Brad Edwards filed a civil suit against Jeffrey Epstein to recover damages for his sexual assault of L.M. *See* Complaint, L.M. v. Epstein, (Exhibit "V").

47. Jane Doe's federal complaint indicated that she sought damages of more than $50,000,000. Listing the amount of damages sought in the complaint was in accord with other civil suits that were filed against Epstein (before any lawsuit filed by Edwards). *See* Complaint, Jane Doe #4 v. Epstein (Exhibit "W") (filed by Herman and Mermelstein, PA).

48. At about the same time as Edwards filed his three lawsuits against Epstein, other civil attorneys were filing similar lawsuits against Epstein. For example, on or about April 14, 2008 another law firm, Herman and Mermelstein, filed the first civil action against Epstein on behalf of one of its seven clients who were molested by Epstein. The complaints that attorney Herman filed on behalf of his seven clients were similar in tenor and tone to the complaint that Edwards filed on behalf of his three clients. *See id.*

49. Over the next year and a half, more than 20 other similar civil actions were filed by various attorneys against Epstein alleging sexual assault of minor girls. These complaints were also similar in tenor and tone to the complaint that Edwards filed on behalf of his clients. These complaints are all public record and have not been attached, but are available in this Court's files and the files of the U.S. District Court for the Southern District of Florida.

50. In addition to the complaints filed against Epstein in Florida, a female in New York, Ava Cordero, filed a lawsuit against Epstein in New York making similar allegations - that Epstein paid her for a massage then forced her to give him oral sex and molested her in other ways when she was only 16 years old. Cordero was born a male, and in her complaint she

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alleges that Epstein told her during the "massage", "I love how young you are. You have a tight butt like a baby". *See* Jeff Epstein Sued for "Repeated Sexual Assaults" on Teen, New York Post, October 17, 2007, by Dareh Gregorian, link at: http://www.nypost.com/p/news/regional/item_44zlWyLUFH7R1OUtKYGPbP;jsessionid=6CA3EBF1BEF68F5DE14BFB2CAA5C37E0. *See* Article attached hereto as Exhibit "X".

51. Edwards's three complaints against Epstein contained less detail about sexual abuse than (as one example) a complaint filed by attorney Robert Josephsberg from the law firm of Podhurst Orseck. *See* Complaint, Jane Doe 102 v. Epstein (Exhibit "B"). As recounted in detail in this Complaint, Jane Doe 102 was 15 years old when Ghislaine Maxwell discovered her and lured her to Epstein's house. Maxwell and Epstein forced her to have sex with both of them and within weeks Maxwell and Epstein were flying her all over the world. According to the Complaint, Jane Doe 102 was forced to live as one of Epstein's underage sex slaves for years and was forced to have sex with not only Maxwell and Epstein but also other politicians, businessmen, royalty, academicians, etc. She was even made to watch Epstein have sex with three 12-year-old French girls that were sent to him for his birthday by a French citizen that is a friend of Epstein's. Luckily, Jane Doe 102 escaped to Australia to get away from Epstein and Maxwell's sexual abuse.

52. Edwards learned that in addition to civil suits that were filed in court against Epstein, at around the same time other attorneys engaged in pre-filing settlement discussions with Epstein. Rather than face filed civil suits in these cases, Epstein paid money settlements to more than 15 other women who had sexually abused while they were minors. *See* articles regarding settlements attached hereto as Composite Exhibit "Y."

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Epstein's Obstruction of Normal Discovery and Attacks on His Victims

53. Once Edwards filed his civil complaints for his three clients, he began the normal process of discovery for cases such as these. He sent standard discovery requests to Epstein about his sexual abuse of the minor girls, including requests for admissions, request for production, and interrogatories. *See* Edwards Affidavit, Exhibit "N", at ¶¶11-19 and 25. Rather than answer any substantive questions about his sexual abuse and his conspiracy for procuring minor girls for him to abuse, Epstein invoked his 5th amendment right against self-incrimination. An example of Epstein's refusal to answer is attached as Composite Exhibit "Z" (original discovery propounded to Epstein and his responses invoking 5th amendment).

54. During the discovery phase of the civil cases filed against Epstein, Epstein's deposition was taken at least five times. During all of those depositions, Epstein refused to answer any substantive questions about his sexual abuse of minor girls. *See, e.g.,* Deposition Attachments 1, 6 and 7.

55. During these depositions, Epstein further attempted to obstruct legitimate questioning by inserting a variety of irrelevant information about his case. As one of innumerable examples, on March 8, 2010, Mr. Horowitz, representing seven victims, Jane Doe's 2-8, asked, "Q: In 2004, did you rub Jane Doe 3's vagina? A: Excuse me. I'd like to answer that question, as I would like to answer mostly every question you've asked me here today; however, upon advice of counsel, I cannot answer that question. They've advised me I must assert my Sixth Amendment, Fifth Amendment and Fourteenth Amendment Rights against self--excuse me, against--under the Constitution. And though your partner, Jeffrey Herman, was disbarred after filing this lawsuit [a statement that was untrue], Mr. Edwards' partner sits in jail for

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fabricating cases of a sexual nature fleecing unsuspecting Florida investors and others out of millions of dollars for cases of a sexual nature with--I'd like to answer your questions; however if I--I'm told that if I do so, I risk losing my counsel's representation; therefore I must accept their advice." Epstein deposition, March 8, 2010, at 106 (Deposition attachment #10).

56. When Edwards had the opportunity to take Epstein's deposition, he only asked reasonable questions, all of which related to the merits of the cases against Epstein. All depositions of Epstein in which Mr. Edwards participated on behalf of his clients are attached to this motion. *See* Edwards Affidavit, Exhibit "N" at ¶11 and Deposition attachments #1, 6, 7, 10, 11, 12, and 13. Cf. with Deposition of Epstein taken by an attorney representing BB (one in which Edwards was not participating), http://www.youtube.com/watch?v=V-dqoEyYXx4; and http://www.youtube.com/watch?v=YCNiYltW-r0

57. Edwards's efforts to obtain information about Epstein's organization for procuring young girls was also blocked because Epstein's co-conspirators took the Fifth. Deposition of Sarah Kellen, March 24, 2010 (hereinafter "Kellen Depo.") (Deposition attachment #14); Deposition of Nadia Marcinkova, April 13, 2010, (Deposition attachment #9); Deposition of Adriana Mucinska Ross, March 15, 2010 (hereinafter "Ross Depo.") (Deposition attachment #15). Each of these co-conspirators invoked their respective rights against self-incrimination as to all relevant questions, and the depositions have been attached.

58. At all relevant times Edwards has had a good faith basis to believe and did in fact believe Sarah Kellen was an employee of Epstein's and had been identified as a defendant in at least one of the complaints against Epstein for her role in bringing girls to Epstein's mansion to be abused. At the deposition, she was represented by Bruce Reinhart. She invoked the Fifth on

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all substantive questions regarding her role in arranging for minor girls to come to Epstein's mansion to be sexually abused. Reinhart had previously been an Assistant United States Attorney in the U.S. Attorney's Office for the Southern District of Florida when Epstein was being investigated criminally by Reinhart's office. Reinhart left the United States Attorney's Office and was immediately hired by Epstein to represent Epstein's pilots and certain co-conspirators during the civil cases against Epstein. *See* Edwards Affidavit, Exhibit "N" at ¶11.

59. Edwards also had other lines of legitimate discovery blocked through the efforts of Epstein and others. For example, Edwards learned through deposition that Ghislaine Maxwell was involved in managing Epstein's affairs and companies. *See* deposition of Epstein's house manager Janusz Banziak, February 16, 2010 at page 14, lines 20-23 (Deposition Attachment #16); *See* deposition of Epstein's housekeeper Louella Rabuyo, October 20, 2009, page 9, lines 17-25 (Deposition Attachment #17); *See* deposition of Epstein's pilot Larry Eugene Morrison, October 6, 2009, page 102-103 (Deposition Attachment #18); *See* deposition of Alfredo Rodriguez, August 7, 2009, page 302-306 and 348 (Deposition Attachment #8); *See* also Prince Andrew's Friend, Ghislaine Maxwell, Some Underage Girls and A Very Disturbing Story, September 23, 2007 by Wendy Leigh, link at http://www.redicecreations.com/article.php?id=1895OHANNA SJOBERG. Exhibit "AA".

60. Alfredo Rodriguez testified that Maxwell took photos of girls without the girls' knowledge, kept the images on her computer, knew the names of the underage girls and their respective phone numbers and other underage victims were molested by Epstein and Maxwell together. *See* Deposition of Rodriguez, Deposition attachment # 8 at 64, 169-170 and 236.

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61. In reasonable reliance on this and other information, Edwards served Maxwell for deposition in 2009. *See* Deposition Notice attached as Exhibit "BB." Maxwell was represented by Brett Jaffe of the New York firm of Cohen and Gresser, and Edwards understood that her attorney was paid for (directly or indirectly) by Epstein. She was reluctant to give her deposition, and Edwards tried to work with her attorney to take her deposition on terms that would be acceptable to both sides. The result was the attached confidentiality agreement, under which Maxwell agreed to drop any objections to the deposition, attached hereto as Exhibit "CC." Maxwell, however, contrived to avoid the deposition. On June 29, 2010, one day before Edwards was to fly to NY to take Maxwell's deposition, her attorney informed Edwards that Maxwell's mother was deathly ill and Maxwell was consequently flying to England with no intention of returning to the United States. Despite that assertion, Ghislaine Maxwell was in fact in the country on July 31, 2010, as she attended the wedding of Chelsea Clinton (former President Clinton's daughter) and was captured in a photograph taken for OK magazine. Photos from Issue 809 of the publication *See* US Weekly dated August 16, 2010 are attached hereto as Exhibit "DD" and Edwards Affidavit, Exhibit "N" at ¶12.

62. Maxwell is not the only important witness to lie to avoid deposition by Edwards. Upon review of the message pads that were taken from Epstein's home in the police trash pulls, *see* Exhibit "J" *supra*, many were from Jean Luc Brunel, a French citizen and one of Epstein's closest pals. He left messages for Epstein. One dated 4/1/05 said, "He has a teacher for you to teach you how to speak Russian. She is 2x8 years old, not blonde. Lessons are free and you can have your 1st today if you call." *See* Messages taken from Jean Luc Brunel are attached hereto as Exhibit "EE." In light of these circumstances of the case, this message reasonably suggested to

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Edwards that Brunel might have been procuring two eight-year-old girls for Epstein to sexually abuse. According to widely circulated press reports reviewed by Edwards, Brunel is in his sixties and has a reputation throughout the world (and especially in the modeling industry) as a cocaine addict that has for years molested children through modeling agencies while acting as their agent – conduct that has been the subject of critical reports, books, several news articles, and a 60 Minutes documentary on Brunel's sexual exploitation of underage models. *See* http://bradmillershero.blogspot.com/2010/08/women-are-objects.html, attached hereto as Exhibit "FF."

63. Edwards learned that Brunel is also someone that visited Epstein on approximately 67 occasions while Epstein was in jail. *See* Epstein's jail visitor log attached as Exhibit "GG."

64. Edwards learned that Brunel currently runs the modeling agency MC2, a company for which Epstein provides financial support. *See* Message Pad's attached as Exhibit "J" *supra* and Sworn Statement of MC2 employee Maritza Vasquez, June 15, 2010, "Maritza Vasquez Sworn Statement" attached at Exhibit "HH" at 1-16.

65. Employees of MC2 told Edwards that Epstein's numerous condos at 301 East 66 Street in New York were used to house young models. Edwards was told that MC2 modeling agency, affiliated with Epstein and Brunel brought underage girls from all over the world, promising them modeling contracts. Epstein and Brunel would then obtain a visa for these girls, then would charge the underage girls rent, presumably to live as underage prostitutes in the condos. *See* Maritza Vasquez Sworn Statement, Exhibit "HH" at 7-10, 12-15, 29-30, 39-41, 59-60 and 62-67.

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66. In view of this information suggesting Brunel could provide significant evidence of Epstein's trafficking in young girls for sexual abuse, Edwards had Brunel served in New York for deposition. *See* Notice of Deposition of Jean Luc Brunel attached hereto as Exhibit "II." Before the deposition took place, Brunel's attorney (Tama Kudman of West Palm Beach) contacted Edwards to delay the deposition date. Eventually Kudman informed Edwards in January 2009 that Brunel had left the country and was back in France with no plans to return. This information was untrue; Brunel was actually staying with Epstein in West Palm Beach. *See* Banasiak deposition, deposition attachment #16 at 154-160 and 172-175; see also pages from Epstein's probation file evidencing Jean Luc Brunel (JLB) staying at his house during that relevant period of time attached Exhibit "JJ". As a result, Edwards filed a Motion for Contempt, attached hereto as Exhibit "KK" (Because Epstein settled this case, the motion was never ruled upon.)

67. Edwards was also informed that Epstein paid for not only Brunel's representation during the civil process but also paid for legal representation for Sarah Kellen (Epstein's executive assistant and procurer of girls for him to abuse), Larry Visoski (Epstein's personal pilot), Dave Rogers (Epstein's personal pilot), Larry Harrison (Epstein's personal pilot), Louella Rabuyo (Epstein's housekeeper), Nadia Marcinkova (Epstein's live-in sex slave), Ghislaine Maxwell (manager of Epstein's affairs and businesses), Mark Epstein (Epstein's brother), and Janusz Banasiak (Epstein's house manager) It was nearly impossible to take a deposition of someone that would have helpful information that was not represented by an attorney paid for by Epstein. *See* Edwards Affidavit, Exhibit "N" at ¶11.

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68. While Epstein and others were preventing any legitimate discovery into his sexual abuse of minor girls, at the same time he was engaging (through his attorneys) in brutal questioning of the girls who had filed civil suits against him, questioning so savage that it made local headlines. *See* Jane Musgrave, *Victims Seeking Sex offender's Millions See Painful Pasts Used Against Them,* Palm Beach Post News, Jan. 23, 2010, available at http://www.palmbeachpost.com/news/crime/victims-seeking-sex-offenders-millions-see-painful-pasts-192988.html attached hereto as Exhibit "LL."

Edwards Pursues Other Lines of Discovery

69. Because of Epstein's thwarting of discovery and attacks on Edwards's clients, Edwards was forced to pursue other avenues of discovery. Edwards only pursued legitimate discovery designed to further the cases filed against Epstein. *See* Edwards Affidavit, Exhibit "N" at ¶11.

70. Edwards notified Epstein's attorneys of his intent to take Bill Clinton's deposition. Edwards possessed a legitimate basis for doing so: (a) Clinton was friends with Ghislaine Maxwell who was Epstein's longtime companion and helped to run Epstein's companies, kept images of naked underage children on her computer, helped to recruit underage children for Epstein, engaged in lesbian sex with underage females that she procured for Epstein, and photographed underage females in sexually explicit poses and kept child pornography on her computer; (b) it was national news when Clinton traveled with Epstein aboard Epstein's private plane to Africa and the news articles classified Clinton as Epstein's friend. (c) the complaint filed on behalf of Jane Doe No. 102 stated generally that she was required by Epstein to be sexually exploited by not only Epstein but also Epstein's "adult male peers, including royalty,

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politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories Clinton and acquaintances of Clinton fall into. The flight logs showed Clinton traveling on Epstein's plane on numerous occasions between 2002 and 2005. *See* Flight logs attached hereto as Exhibit "MM." Clinton traveled on many of those flights with Ghislaine Maxwell, Sarah Kellen, and Adriana Mucinska, - all employees and/or co-conspirators of Epstein's that were closely connected to Epstein's child exploitation and sexual abuse. The documents clearly show that Clinton frequently flew with Epstein aboard his plane, then suddenly stopped - raising the suspicion that the friendship abruptly ended, perhaps because of events related to Epstein's sexual abuse of children. Epstein's personal phone directory from his computer contains e-mail addresses for Clinton along with 21 phone numbers for him, including those for his assistant (Doug Band), his schedulers, and what appear to be Clinton's personal numbers. This information certainly leads one to believe that Clinton might well be a source of relevant information and efforts to obtain discovery from him were reasonably calculated to lead to admissible evidence. *See* Exhibits "B", "F" "AA", "DD", and "MM" and Edwards Affidavit, Exhibit "N" at ¶15.

71. Bradley J. Edwards, Esq., provided notice that he intended to take the deposition of Donald Trump. Edwards possessed a legitimate basis for doing so: (a) The message pads confiscated from Epstein's home indicated that Trump called Epstein's West Palm Beach mansion on several occasions during the time period most relevant to my Edwards's clients' complaints; (b) Trump was quoted in a *Vanity Fair* article about Epstein as saying "I've known Jeff for fifteen years. Terrific guy," "He's a lot of fun to be with. It is even said that he likes beautiful women as much as I do, and many of them are on the younger side. No doubt about it --

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Jeffrey enjoys his social life." Jeffrey Epstein: International Moneyman of Mystery; He's pals with a passel of Nobel Prize–winning scientists, CEOs like Leslie Wexner of the Limited, socialite Ghislaine Maxwell, even Donald Trump. But it wasn't until he flew Bill Clinton, Kevin Spacey, and Chris Tucker to Africa on his private Boeing 727 that the world began to wonder who he is. By Landon Thomas Jr. (*See* article attached hereto as Exhibit "NN") (c) Trump allegedly banned Epstein from his Maralago Club in West Palm Beach because Epstein sexually assaulted an underage girl at the club; (d) Jane Doe No. 102's complaint alleged that Jane Doe 102 was initially approached at Trump's Maralago by Ghislaine Maxwell and recruited to be Maxwell and Epstein's underage sex slave; (e) Mark Epstein (Jeffrrey Epstein's brother) testified that Trump flew on Jeffrey Epstein's plane with him (the same plane that Jane Doe 102 alleged was used to have sex with underage girls); (f) Trump had been to Epstein's home in Palm Beach; (g) Epstein's phone directory from his computer contains 14 phone numbers for Donald Trump, including emergency numbers, car numbers, and numbers to Trump's security guard and houseman. Based on this information, Edwards reasonably believed that Trump might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition. See deposition of Mark Epstein, September 21, 2009, at 48-50 (Deposition Attachment #19); *See* Jane Doe 102 v. Epstein, Exhibit "B"; Exhibit "F"; "Exhibit"J"; "N" and *See* Edwards Affidavit, Exhibit "N" at ¶13.

72. Edwards provided notice that he intended to depose Alan Dershowitz. Edwards possessed a legitimate basis for doing so: (a) Dershowitz is believed to have been friends with Epstein for many years; (b) in one news article Dershowitz comments that, "I'm on my 20th book... The only person outside of my immediate family that I send drafts to is Jeffrey" The

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Talented Mr. Epstein, By Vicky Ward on January, 2005 in Published Work, Vanity Fair (*See* article attached as Exhibit "OO"); (c) Epstein's housekeeper Alfredo Rodriguez testified that Dershowitz stayed at Epstein's house during the years when Epstein was assaulting minor females on a daily basis; (d) Rodriguez testified that Dershowitz was at Epstein's house at times when underage females where there being molested by Epstein (see Alfredo Rodriguez deposition at 278-280, 385, 426-427); (e) Dershowitz reportedly assisted in attempting to persuade the Palm Beach State Attorney's Office that because the underage females alleged to have been victims of Epstein's abuse lacked credibility and could not be believed that they were at Epstein's house, when Dershowitz himself was an eyewitness to their presence at the house; (f) Jane Doe No. 102 stated generally that Epstein forced her to be sexually exploited by not only Epstein but also Epstein's "adult male peers, including royalty, politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories that Dershowitz and acquaintances of Dershowitz fall into; (g) during the years 2002-2005 Alan Dershowitz was on Epstein's plane on several occasions according to the flight logs produced by Epstein's pilot and information (described above) suggested that sexual assaults may have taken place on the plane; (h) Epstein donated $30 Million one year to the university at which Dershowitz teaches. Based on this information, Edwards had a reasonable basis to believe that Dershowitz might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition. *See* Dershowitz letters to the State Attorney's office attached as Exhibit "PP"; Deposition of Alfredo Rodriguez at 278-280; Flight Logs Exhibit "MM"; Exhibits "B" and "OO"; and Edwards Affidavit, Exhibit "N" at ¶14.

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73. Epstein's complaint alleges that Edwards provided notice that he wished to take the deposition of Tommy Mattola. That assertion is untrue. Mr. Mattola's deposition was set by the law firm of Searcy Denny Scarola Barnhart and Shipley. *See* Edwards Affidavit, Exhibit "N" at ¶16.

74. Edwards gave notice that he intended to take David Copperfield's deposition. Edwards possessed a legitimate basis for doing so. Epstein's housekeeper and one of the only witnesses who did not appear for deposition with an Epstein bought attorney, Alfredo Rodriguez, testified that David Copperfield was a guest at Epstein's house on several occasions. His name also appears frequently in the message pads confiscated from Epstein's house. It has been publicly reported that Copperfield himself has had allegations of sexual misconduct made against him by women claiming he sexually abused them, and one of Epstein's sexual assault victims also alleged that Copperfield had touched her in an improper sexual way while she was at Epstein's house. Mr. Copperfield likely has relevant information and deposition was reasonably calculated to lead to the discovery of admissible evidence. *See* Edwards Affidavit, Exhibit "N" at ¶17.

75. Epstein also takes issue with Edwards identifying Bill Richardson as a possible witness. Richardson was properly identified as a possible witness because Epstein's personal pilot testified to Richardson joining Epstein at Epstein's New Mexico Ranch. There was information indicating that Epstein had young girls at his ranch which, given the circumstances of the case, raised the reasonable inference he was sexually abusing these girls as he had abused girls in West Palm Beach and elsewhere. Richardson had also returned campaign donations that were given to him by Epstein, indicating that he believed that there was something about Epstein

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with which he did not want to be associated. Richardson was not called to testify nor was he ever subpoenaed to testify. *See* Edwards Affidavit, Exhibit "N" at ¶18.

76. Edwards learned of allegations that Epstein engaged in sexual abuse of minors on his private aircraft. *See* Jane Doe 102 Complaint, Exhibit "B." Accordingly, Edwards pursued discovery to confirm these allegations.

77. Discovery of the pilot and flight logs was proper in the cases brought by Edwards against Epstein. Jane Doe filed a federal RICO claim against Epstein that was an active claim through much of the litigation. The RICO claim alleged that Epstein ran an expansive criminal enterprise that involved and depended upon his plane travel. Although Judge Marra dismissed the RICO claim at some point in the federal litigation, the legal team representing Edwards' clients intended to pursue an appeal of that dismissal. Moreover, all of the subjects mentioned in the RICO claim remained relevant to other aspects of Jane Doe's claims against Epstein, including in particular her claim for punitive damages. *See* Edwards Affidavit, Exhibit "N" at ¶19.

78. Discovery of the pilot and flight logs was also proper in the cases brought by Edwards against Epstein because of the need to obtain evidence of a federal nexus. Edwards's client Jane Doe was proceeding to trial on a federal claim under 18 U.S.C. § 2255. Section 2255 is a federal statute which (unlike relevant state statutes) established a minimum level of recovery for victims of the violation of its provisions. Proceeding under the statute, however, required a "federal nexus" to the sexual assaults. Jane Doe had two grounds on which to argue that such a nexus existed to her abuse by Epstein: first, his use of telephone to arrange for girls to be abused; and, second, his travel on planes in interstate commerce. During the course of the litigation,

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Edwards anticipated that Epstein would argue that Jane Doe's proof of the federal nexus was inadequate. These fears were realized when Epstein filed a summary judgment motion raising this argument. In response, the other attorneys and Edwards representing Jane Doe used the flight log evidence to respond to Epstein's summary judgment motion, explaining that the flight logs demonstrated that Epstein had traveled in interstate commerce for the purpose of facilitating his sexual assaults. Because Epstein chose to settle the case before trial, Judge Marra did not rule on the summary judgment motion.

79. Edwards had further reason to believe and did in fact believe that the pilot and flight logs might contain relevant evidence for the cases against Epstein. Jane Doe No. 102's complaint outlined Epstein's daily sexual exploitation and abuse of underage minors as young as 12 years old and alleged that Epstein's plane was used to transport underage females to be sexually abused by him and his friends. The flight logs accordingly were a potential source of information about either additional girls who were victims of Epstein's abuse or friends of Epstein who may have witnessed or even participated in the abuse. Based on this information, Edwards reasonably pursued the flight logs in discovery.

80. In the fall of 2009, Epstein gave a recorded interview to George Rush, a reporter with the *New York Daily News* about pending legal proceedings. In that interview, Epstein demonstrated an utter lack of remorse for his crimes (but indirectly admitted his crimes) by stating:

- People do not like it when people make good and that was one reason he (Epstein) was being targeted by civil suits filed by young girls in Florida;
- He (Epstein) had done nothing wrong;

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- He (Epstein) had gone to jail in Florida for soliciting prostitution for no reason;
- If the same thing (i.e., sexual abuse of minor girls) had happened in New York, he (Epstein) would have received only a $200 fine;
- Bradley J. Edwards was the one causing all of Epstein's problems (i.e., the civil suits brought by Jane Doe and other girls);
- L.M. came to him as a prostitute and a drug user (i.e., came to Epstein for sex, rather than Epstein pursuing her);
- All the girls suing him are only trying to get a meal ticket;
- The only thing he might have done wrong was to maybe cross the line a little too closely;
- He (Epstein) was very upset that Edwards had subpoenaed Ghisline Maxwell, that she was a good person that did nothing wrong (i.e., had done nothing wrong even though she helped procure young girls to satisfy Epstein's sexual desires);
- With regard to Jane Doe 102 v. Epstein, which involved an allegation that Epstein had repeatedly sexually abused a 15-year-old girl, forced her to have sex with his friends, and flew her on his private plane nationally and internationally for the purposes of sexually molesting and abusing her, he (Epstein) flippantly said that the case was dismissed, indicating that the allegations were ridiculous and untrue.

See Affidavit of Michael J. Fisten attached hereto as Exhibit "QQ."

81. The Rush interview also demonstrated perjury (a federal crime) on the part of Epstein. Epstein lied about not knowing George Rush. *See* Epstein Deposition, February 17, 2010, taken in L.M. v. Jeffrey Epstein, case 50-2008-CA-028051, page 154, line 4 through 155 line 9, (Deposition attachment #7), wherein Jeffrey Epstein clearly impresses that he does not recognize George Rush from the New York Daily News. This impression was given despite the fact that he gave a lengthy personal interview about details of the case that was tape recorded with George Rush.

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Epstein's Harassment of Witnesses Against Him

82. At all relevant times Edwards has a good faith basis to believe and did in fact believe that Epstein engaged in threatening witnesses. *See* Incident Report, Exhibit "A" at p. 82, U.S. Attorney's Correspondence, Exhibit "C" - Indictments drafted by Federal Government against Epstein; and Edwards Affidavit, Exhibit "N" at ¶11.

83. Despite three no contact orders entered against Epstein (*see* Exhibit C, *supra*), Edwards learned that Epstein continued to harass his victims. For example, Jane Doe had a trial set for her civil case against him on July 19, 2010. As that trial date approached, defendant Epstein intimidated her in violation of the judicial no-contact orders. On July 1, 2010, he had a "private investigator" tail Jane Doe – following her every move, stopping when she stopped, driving when she drove, refusing to pass when she pulled over. When Jane Doe ultimately drove to her home, the "private investigator" then parked in his car approximately 25 feet from Jane Doe house and flashed his high beam lights intermittently into the home. Even more threateningly, at about 10:30 p.m., when Jane Doe fled her home in the company of a retired police officer employed by Jane Doe's counsel, the "private investigator" attempted to follow Jane Doe despite a request not to do so. The retired officer successfully took evasive action and placed Jane Doe in a secure, undisclosed location that night. Other harassing actions against Jane Doe also followed. *See* Motion for Contempt filed by Edwards in Jane Doe v. Epstein detailing the event, including Fisten Affidavit attached to Motion, Composite Exhibit "RR."

Epstein Settlement of Civil Claims Against Him for Sexual Abuse of Children

84. The civil cases Edwards filed against Epstein on behalf of L.M., E.W., and Jane Doe were reasonably perceived by Edwards to be very strong cases. Because Epstein had

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sexually assaulted these girls, he had committed several serious torts against them and would be liable to them for appropriate damages. *See* Preceding Undisputed Facts. Because of the outrageousness of Epstein's sexual abuse of minor girls, Edwards reasonably expected that Epstein would also be liable for punitive damages to the girls. Because Edwards could show that Epstein had molested children for years and designed a complex premeditated scheme to procure different minors everyday to satisfy his addiction to sex with minors, the punitive damages would have to be sufficient to deter him from this illegal conduct that he had engaged in daily for years. Epstein was and is a billionaire. *See* Complaint, ¶49 (referring to "Palm Beach Billionaire"); *see also* Epstein Deposition, February 17, 2010, at 172-176 (Deposition Attachment #7) (taking the Fifth when asked whether he is a billionaire). Accordingly, Edwards reasonably believed the punitive damages that would have to be awarded against Epstein would have been substantial enough to punish him severely enough for his past conduct as well as deter him from repeating his offenses in the future. *See* Edwards Affidavit, Exhibit "N" at ¶19.

85. On July 6, 2010, rather than face trial for the civil suits that had been filed against him by L.M., E.W., and Jane Doe, defendant Epstein settled the cases against him. The terms of the settlement are confidential. The settlement amounts are highly probative in the instant action as Epstein bases his claims that Edwards was involved in the Ponzi scheme on Epstein's inability to settle the L.M., E.W., and Jane Doe cases for "minimal value". His continued inability to settle the claims for "minimal value" after the Ponzi scheme was uncovered would be highly probative in discrediting any causal relationship between the Ponzi scheme and Edwards's settlement negotiations. *See* Edwards Affidavit, Exhibit "N" at ¶21.

<u>*Edwards Non-Involvement in Fraud by Scott Rothstein*</u>

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86. From in or about 2005, through in or about November 2009, Scott Rothstein appears to have run a giant Ponzi scheme at his law firm of Rothstein, Rosenfeldt and Adler P.A. ("RRA"). This Ponzi scheme involved Rothstein falsely informing investors that settlement agreements had been reached with putative defendants based upon claims of sexual harassment and/or whistle-blower actions. Rothstein falsely informed the investors that the potential settlement agreements were available for purchase. Plea Agreement at 2, *United States v. Scott W. Rothstein*, No. 9-60331-CR-COHN (S.D. Fla. Jan. 27, 2010) attached hereto as Exhibit "SS."

87. It has been alleged that among other cases that Rothstein used to lure investors into his Ponzi scheme were the cases against Epstein that were being handled by Bradley J. Edwards, Esq. Edwards had no knowledge of the fraud or any such use of the Epstein cases. *See* Edwards Affidavit, Exhibit "N" at ¶9.

88. Bradley J. Edwards, Esq., joined RRA in about April 2009 and left RRA in November 2009 – a period of less than one year. Edwards would not have joined RRA had he been aware that Scott Rothstein was running a giant Ponzi scheme at the firm. Edwards left RRA shortly after learning of Rothstein's fraudulent scheme. *Id.* at ¶8.

89. At no time prior to the public disclosure of Rothstein's Ponzi scheme did Edwards know or have reason to believe that Rothstein was using legitimate claims that Edwards was prosecuting against Epstein for any fraudulent or otherwise illegitimate purpose. *Id.* at ¶20.

90. Edwards never substantively discussed the merits of any of his three cases against Epstein with Rothstein. *See* Deposition of Bradley J. Edwards taken March 23, 2010, at 110-16. (hereinafter "Edwards Depo") (Deposition Attachment #22).

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91. On July 20, 2010, Bradley Edwards received a letter from the U.S. Attorney's Office for the Southern District of Florida – the office responsible for prosecuting Rothstein's Ponzi scheme. The letter indicated that law enforcement agencies had determined that Edwards was "a victim (or potential victim)" of Scott Rothstein's federal crimes. The letter informed Edwards of his rights as a victim of Rothstein's fraud and promised to keep Edwards informed about subsequent developments in Rothstein's prosecution. *See* Letter attached hereto as Exhibit "TT."

92. Jeffrey Epstein filed a complaint with the Florida Bar against Bradley Edwards, Esq., raising allegations that Edwards and others were involved in the wrongdoing of Scott Rothstein. After investigating the claim, the Florida Bar dismissed this complaint. *See* Edwards Affidavit, Exhibit "N" at ¶23.

Epstein Takes the Fifth When Asked Substantive Questions About His Claims Against Edwards

93. On March 17, 2010, defendant Epstein was deposed about his lawsuit against Edwards. Rather than answer substantive questions about his lawsuit, Epstein repeatedly invoked his Fifth Amendment privilege. *See* Epstein Depo. taken 3/17/10, Deposition Attachment #1.

94. In his deposition, Epstein took the Fifth rather than answer the question: "Specifically what are the allegations against you which you contend Mr. Edwards ginned up?" *Id.* at 34.

95. In his deposition, Epstein took the Fifth rather than name people in California that Edwards had tried to depose to increase the settlement value of the civil suit he was handling. *Id.* at 37.

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96. In his deposition, Epstein took the Fifth rather than answer the question: "Do you know former President Clinton personally." *Id.*

97. In his deposition, Epstein took the Fifth rather than answer the question: "Are you now telling us that there were claims against you that were fabricated by Mr. Edwards?" *Id.* at 39.

98. In his deposition, Epstein took the Fifth rather than answer the question, "Well, which of Mr. Edwards' cases do you contend were fabricated." *Id.*

99. In his deposition, Epstein took the Fifth rather than answer the question: "What is the actual value that you contend the claim of E.W. against you has?" *Id.* at 45.

100. In his deposition, Epstein took the Fifth rather than answer a question about the actual value of the claim of L.M. and Jane Doe against him. *Id.*

101. In his deposition, taken prior to the settlement of Edwards's clients claims against Epstein, Epstein took the Fifth rather than answer the question: "Is there any pending claim against you which you contend is fabricated?" *Id.* at 71.

102. In his deposition, Epstein took the Fifth rather than answer the question: "Did you ever have damaging evidence in your garbage?" *Id.* at 74.

103. In his deposition, Epstein took the Fifth rather than answer the question: "Did sexual assaults ever take place on a private airplane on which you were a passenger?" *Id.* at 88.

104. In his deposition, Epstein took the Fifth rather than answer the question: "Does a flight log kept for a private jet used by you contain the names of celebrities, dignitaries or international figures?" *Id.* at 89.

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105. In his deposition, Epstein took the Fifth rather than answer the question: "Have you ever socialized with Donald Trump in the presence of females under the age of 18?" *Id.* at 89.

106. In his deposition, Epstein took the Fifth rather than answer the question: "Have you ever socialized with Alan Dershowitz in the presence of females under the age of 18." *Id.* at 90.

107. In his deposition, Epstein took the Fifth rather than answer the question: "Have you ever socialized with Mr. Mottola in the presence of females under the age of 18?" *Id.* at 91-92.

108. In his deposition, Epstein took the Fifth rather than answer the question: "Did you ever socialize with David Copperfield in the presence of females under the age of 18?" *Id.* at

109. In his deposition, Epstein took the Fifth rather than answer the question: "Have you ever socialized with Mr. Richardson [Governor of New Mexico and formerly U.S. Representative and Ambassador to the United Nations] in the presence of females under the age of 18." *Id.* at 94.

110. In his deposition, Epstein took the Fifth rather than answer the question: "Have you ever sexually abused children?" *Id.* at 95.

111. In his deposition, Epstein took the Fifth rather than answer the question: "Did you have staff members that assisted you in scheduling appointments with underage females; that is, females under the age of 18." *Id.* at 97-98.

112. In his deposition, Epstein took the Fifth rather than answer the question: "On how many occasions did you solicit prostitution." *Id.* at 102.

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113. In his deposition, Epstein took the Fifth rather than answer the question: "How many minors have you procured for prostitution?" *Id.* at 104.

114. In his deposition, Epstein took the Fifth rather than answer the question: "Have you ever coerced, induced or enticed any minor to engage in any sexual act with you?" *Id.* at 107.

115. In his deposition, Epstein took the Fifth rather than answer the question: "How many times have you engaged in fondling underage females?" *Id.* at 108.

116. In his deposition, Epstein took the Fifth rather than answer the question: "How many times have you engaged in oral sex with females under the age of 18?" *Id.* at 110.

117. In his deposition, Epstein took the Fifth rather than answer the question: "Do you have a personal sexual preference for children?" *Id.* at 111-12.

118. In his deposition, Epstein took the Fifth rather than answer the question: "Your Complaint at page 27, paragraph 49, says that 'RRA and the litigation team took an emotionally driven set of facts involving alleged innocent, unsuspecting, underage females and a Palm Beach billionaire, and sought to turn it into a goldmine,' end of quote. Who is the Palm Beach billionaire referred to in that sentence?" *Id.* at 112-13.

119. In his deposition, Epstein took the Fifth rather than answer the question: "Who are the people who are authorized to make payment [to your lawyers] on your behalf?" *Id.* at 120.

120. In his deposition, Epstein took the Fifth rather than answer the question: "Is there anything in L.M.'s Complaint that was filed against you in September of 2008 which you contend to be false?" *Id.* at 128.

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on November 4th, 2010 a copy of the foregoing has been served via Fax and U.S. Mail to all those on the attached service list.

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By: _____
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EXHIBIT N

AFFIDAVIT OF BRADLEY JAMES EDWARDS

1. I am an attorney in good standing with the Florida Bar and admitted to practice in the Southern District of Florida. I am currently a partner in the law firm of Farmer, Jaffe, Weissing, Edwards, Fistos & Lehrman, P.L.

2. In 2008, I was a sole practitioner running a personal injury law firm in Hollywood, FL. While a sole practitioner I was retained by three clients, L.M., E.W., and Jane Doe to pursue civil litigation against Jeffrey Epstein for sexually abusing them while they were minor girls. I agreed to represent these girls, along with attorney Jay Howell (an attorney in Jacksonville, Florida with Jay Howell & Associates) and Professor Paul Cassell (a law professor at the University of Utah College Of Law). I filed state court actions on behalf of L.M. and E.W. and a federal court action on behalf of Jane Doe. All of the cases were filed in the summer of 2008.

3. My clients received correspondence from the U.S. Department of Justice regarding their rights as victims of Epstein's federal sex offenses. (True and accurate copies of the letters are attached to Statement of Undisputed Facts as Exhibit "M")

4. In mid June 2008, I contacted Assistant United States Attorney Marie Villafaña to inform her that I represented Jane Doe #1(E.W.) and, later, Jane Doe #2(L.M.). I asked to meet to provide information regarding Epstein. AUSA Villafaña did not advise me that a plea agreement had already been negotiated with Epstein's attorneys that would block federal prosecution. AUSA Villafaña did indicate that federal investigators had concrete evidence and information that Epstein had sexually molested at least 40 underage minor females, including E.W., Jane Doe and L.M.

5. I also requested from the U.S. Attorney's Office the information and evidence that they had collected regarding Epstein's sexual abuse of his clients. However, the U.S. Attorney's Office declined to provide any such information to me. The U.S. Attorney's Office also declined to provide any such information to the other attorneys who represented victims of Epstein's sexual assaults.

6. I was informed that on Friday, June 27, 2008, at approximately 4:15 p.m., AUSA Villafaña received a copy of Epstein's proposed state plea agreement and learned that the plea was scheduled for 8:30 a.m., Monday, June 30, 2008. She called me to provide notice to my clients regarding the hearing. She did not tell me that the guilty pleas in state court would bring an end to the possibility of federal prosecution pursuant to the plea agreement. My clients did not learn and understand this fact until July 11, 2008, when the agreement was described during a hearing held before Judge Marra on the Crime Victims' Rights Act action that I had filed.

7. In the summer of 2008 I filed complaints against Jeffrey Epstein on behalf of L.M., E.W., and Jane Doe.

8. In the Spring of 2009 (approximately April), I joined the law firm of Rothstein, Rosenfeldt and Adler, P.A. ("RRA"). I brought my existing clients with me when I joined RRA, including L.M., E.W., and Jane Doe. When I joined the firm, I was not aware that Scott Rothstein was running a Ponzi scheme at RRA. Had I known such a Ponzi scheme was in place, I would never have joined RRA.

9. I am now aware that it has been alleged that Scott Rothstein made fraudulent presentations to investors about the lawsuits that I had filed on behalf of my clients against Epstein and that it has been alleged that these lawsuits were used to fraudulently lure investors into Rothstein's Ponzi scheme. I never met a single investor, had no part in any such presentations and had no knowledge any such fraud was occurring. If these allegations are true, I had no knowledge that any such fraudulent presentations were occurring and no knowledge of any such improper use of the case files.

10. Epstein's Complaint against me alleges that Rothstein made false statements about cases filed against Epstein, i.e., that RRA had 50 anonymous females who had filed suit against Epstein; that Rothstein sold an interest in personal injury lawsuits, reached agreements to share attorneys fees with non-lawyers, paid clients "up front" money; and that he used the judicial process to further his Ponzi scheme. If Rothstein did any of these things, I had no knowledge of his actions. Because I maintained close contact with my clients, EW, LM and Jane Doe, and Scott Rothstein never met any of them, I know for certain that none of my clients were paid "up front" money by anyone.

11. Epstein alleges that I attempted to take the depositions of his "high profile friends and acquaintances" for no legitimate litigation purpose. This is untrue, as all of my actions in representing L.M., E.W., and Jane Doe were aimed at providing them effective representation in their civil suits. With regard to Epstein's friends, through documents and information obtained in discovery and other means of investigation, I learned that Epstein was sexually molesting minor girls on a daily basis and had been for many years. I also learned the unsurprising fact that he was molesting the girls in the privacy of his mansion in West Palm Beach, meaning that locating witnesses to corroborate their testimony would be difficult to find. I also learned, from the course of the litigation, that Epstein and his lawyers were constantly attacking the credibility of the girls, that Epstein's employees were all represented by lawyers who apparently were paid for (directly or indirectly) by Epstein, that co-conspirators whose representation was also apparently paid for by Epstein were all taking the Fifth (like Epstein) rather than provide information in discovery. For example, I was given reason to believe that Sarah Kellen, Larry Visoski, Larry Harrison, David Rogers, Louella Rabuyo, Nadia Marcinkova, Ghislaine Maxwell, Mark Epstein, and Janusz Banasiak all had lawyers paid for by Epstein. Because Epstein and the co-conspirators in his child molestation criminal enterprise blocked normal discovery avenues, I needed to search for other ordinary approaches to strengthen the cases of my clients. Consistent with my training and experience, these other ordinary approaches included finding other witnesses who could corroborate allegations of sexual abuse of my clients or other girls. Some of these witnesses were friends of Epstein. Given his social status, it also turned out that some of his friends were high-profile individuals.

12. In light of information I received suggesting that British socialite Ghislaine Maxwell, former girlfriend and long-time friend of Epstein's, was involved in managing Epstein's affairs and companies I had her served for deposition for August 17, 2009. (Deposition Notice attached to Statement of Undisputed Facts as Exhibit BB). Maxwell was represented by Brett Jaffe of the New York firm of Cohen and Gresser, and I understood that her attorney was paid for (directly or indirectly) by Epstein. She was reluctant to give her deposition, and I tried to work with her attorney to take her deposition on terms that would be acceptable to both sides. Her attorney and I negotiated a confidentiality agreement, under which Maxwell agreed to drop any objections to the deposition. Maxwell, however, still avoided the deposition. On June 29, 2010, one day before I was to fly to NY to take Maxwell's deposition, her attorney informed me that Maxwell's mother was deathly ill and Maxwell was consequently flying to England with no intention of returning and certainly would not return to the United States before the conclusion of Jane Doe's trial period (August 6, 2010). Despite that assertion, I later learned that Ghislaine Maxwell was in fact in the country on approximately July 31, 2010, as she attended the wedding of Chelsea Clinton (former President Clinton's daughter) and was captured in a photograph taken for US Weekly magazine.

13. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Donald Trump's deposition in the civil suits against him. Trump was properly noticed because: (a) after review of the message pads confiscated from Epstein's home, the legal and investigative team assisting my clients learned that Trump called Epstein's West Palm Beach mansion on several occasions during the time period most relevant to my clients' complaints; (b) Trump was quoted in a *Vanity Fair* article about Epstein as saying **"I've known Jeff for fifteen years. Terrific guy." "He's a lot of fun to be with. It is even said that he likes beautiful women as much as I do, and many of them are on the younger side. No doubt about it – Jeffrey enjoys his social life."** Jeffrey Epstein: International Moneyman of Mystery; **He's pals with a passel of Nobel Prize–winning scientists, CEOs like Leslie Wexner of the Limited, socialite Ghislaine Maxwell, even Donald Trump. But it wasn't until he flew Bill Clinton, Kevin Spacey, and Chris Tucker to Africa on his private Boeing 727 that the world began to wonder who he is. By Landon Thomas Jr.**; (c) I learned through a source that Trump banned Epstein from his Maralago Club in West Palm Beach because Epstein sexually assaulted an underage girl at the club; (d) Jane Doe No. 102's complaint alleged that Jane Doe 102 was initially approached at Trump's Maralago by Ghislaine Maxwell and recruited to be Maxwell and Epstein's underage sex slave; (e) Mark Epstein (Jeffrey Epstein's brother) testified that Trump flew on Jeffrey Epstein's plane with him (the same plane that Jane Doe 102 alleged was used to have sex with underage girls) deposition of Mark Epstein, September 21, 2009 at 48-50; (f) Trump visited Epstein at his home in Palm Beach – the same home where Epstein abused minor girls daily; (g) Epstein's phone directory from his computer contains 14 phone numbers for Donald Trump, including emergency numbers, car numbers, and numbers to Trump's security guard and houseman. Based on this information, I believed that

Trump might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

14. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Alan Dershowitz's deposition in the civil suits against him. Dershowitz was properly noticed because: (a) Dershowitz has been friends with Epstein for many years; (b) in one news article Dershowitz comments that, "I'm on my 20th book... The only person outside of my immediate family that I send drafts to is Jeffrey" The Talented Mr. Epstein, By Vicky Ward on January, 2005 in Published Work, Vanity Fair; (c) Epstein's housekeeper Alfredo Rodriguez testified that Dershowitz stayed at Epstein's house during the years most relevant to my clients; (d) Rodriguez testified that Dershowitz was at Epstein's house at times when underage females where there being molested by Epstein (see Alfredo Rodriguez deposition at 278-280, 385, 426-427); (e) Dershowitz was reportedly involved in persuading the Palm Beach State Attorney's office not to file felony criminal charges against Epstein because the underage females lacked credibility and thus could not be believed that they were at Epstein's house, despite him being an eyewitness that the underage girls were actually there; (f) Jane Doe No. 102 stated generally that Epstein forced her to be sexually exploited by not only Epstein but also Epstein's "adult male peers, including royalty, politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories that Dershowitz and acquaintances of Dershowitz fall into; (g) during the years 2002-2005 Alan Dershowitz was on Epstein's plane on several occasions according to the flight logs produced by Epstein's pilot and information (described above) suggested that sexual assaults may have taken place on the plane; (h) Epstein donated Harvard $30 Million dollars one year, and Harvard was one of the only institutions that did not return Epstein's donation after he was charged with sex offenses against children. Based on this information, I believed that Dershowitz might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

15. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Bill Clinton's deposition. Clinton was properly noticed because: (a) it was well known that Clinton was friends with Ghislaine Maxwell, and several witnesses had provided information that Maxwell helped to run Epstein's companies, kept images of naked underage children on her computer, helped to recruit underage children for Epstein, engaged in lesbian sex with underage females that she procured for Epstein, and photographed underage females in sexually explicit poses and kept child pornography on her computer; (b) newpaper articles stated that Clinton had an affair with Ghislaine Maxwell, who was thought to be second in charge of Epstein's child molestation ring. The Cleveland Leader newspaper, April 10, 2009; (c) it was national news when Clinton traveled with Epstein (and Maxwell) aboard Epstein's private plane to Africa and the news articles classified Clinton as Epstein's friend; (d) the flight logs for the relevant years 2002 - 2005 showed Clinton traveling on Epstein's plane on more than 10 occasions and his assistant, Doug Band, traveled on many more occasions; (e) Jane Doe No. 102 stated generally that she was required by Epstein to be sexually

exploited by not only Epstein but also Epstein's "adult male peers, including royalty, politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories Clinton and acquaintances of Clinton fall into; (f) flight logs showed that Clinton took many flights with Epstein, Ghislaine Maxwell, Sarah Kellen, and Adriana Mucinska, -- all employees and/or co-conspirators of Epstein's that were closely connected to Epstein's child exploitation and sexual abuse; (g) Clinton frequently flew with Epstein aboard his plane, then suddenly stopped – raising the suspicion that the friendship abruptly ended, perhaps because of events related to Epstein's sexual abuse of children; (h) Epstein's personal phone directory from his computer contains e-mail addresses for Clinton along with 21 phone numbers for him, including those for his assistant (Doug Band), his schedulers, and what appear to be Clinton's personal numbers. Based on this information, I believed that Clinton might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

16. Epstein alleges that Tommy Mottola was improperly noticed with a deposition. I did not notice Mattola for deposition. He was noticed for deposition by a law firm representing another one of Epstein's victims – not by me.

17. Epstein alleges that there was something improper in the fact that I notified him that I intended to take the illusionist David Copperfield's deposition. Copperfield was properly noticed because: (a) Epstein's housekeeper Alfredo Rodriguez testified that David Copperfield was a guest on several occasions at Epstein's house; (b) according to the message pads confiscated from Epstein's house, Copperfield called Epstein quite frequently and left messages that indicated they socialized together; (c) Copperfield himself has had similar allegations made against him by women claiming he sexually abused them; (d) one of Epstein's sexual assault victims also alleged that Copperfield had touched her in an improper sexual way while she was at Epstein's house. Based on this information, I believed that Copperfield might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

18. Epstein alleges that there was something improper in the fact that I identified Bill Richardson as a possible witness against him in the civil cases. Richardson was properly identified as a possible witness because Epstein's personal pilot testified to Richardson joining Epstein at Epstein's New Mexico Ranch. See deposition of Larry Morrison, October 6, 2009, at 167-169. There was information indicating that Epstein had young girls at his ranch which, given the circumstances of the case, raised the reasonable inference he was sexually abusing these girls since he had regularly and frequently abused girls in West Palm Beach and elsewhere. Richardson had also returned campaign donations that were given to him by Epstein, indicating that he believed that there was something about Epstein that he did not want to be associated with. Richardson was not called to testify nor was he ever subpoenaed to testify.

19. Epstein alleges that discovery of plane and pilot logs was improper during discovery in the civil cases against him. Discovery of these subjects was clearly proper and

necessary because: (a) Jane Doe filed a federal RICO claim against Epstein that was an active claim through much of the litigation. The RICO claim alleged that Epstein ran an expansive criminal enterprise that involved and depended upon his plane travel. Although Judge Marra dismissed the RICO claim at some point in the federal litigation, the legal team representing my clients intended to pursue an appeal of that dismissal. Moreover, all of the subjects mentioned in the RICO claim remained relevant to other aspects of Jane Doe's claims against Epstein, including in particular her claim for punitive damages; (b) Jane Doe also filed and was proceeding to trial on a federal claim under 18 U.S.C. § 2255. Section 2255 is a federal statute which (unlike other state statutes) guaranteed a minimum level of recovery for Jane Doe. Proceeding under the statute, however, required a "federal nexus" to the sexual assaults. Jane Doe had two grounds on which to argue that such a nexus existed to her abuse by Epstein: first, his use of the telephone to arrange for girls to be abused; and, second, his travel on planes in interstate commerce. During the course of the litigation, I anticipated that Epstein would argue that Jane Doe's proof of the federal nexus was inadequate. These fears were realized when Epstein filed a summary judgment motion raising this argument. In respo-nse, the other attorneys and I representing Jane Doe used the flight log evidence to respond to Epstein's summary judgment motion, explaining that the flight logs demonstrated that Epstein had traveled in interstate commerce for the purpose of facilitating his sexual assaults. Because Epstein chose to settle the case before trial, Judge Marra did not rule on the summary judgment motion. (c) Jane Doe No. 102's complaint outlined Epstein's daily sexual exploitation and abuse of underage minors as young as 12 years old and alleged that he used his plane to transport underage females to be sexually abused by him and his friends. The flight logs accordingly might have information about either additional girls who were victims of Epstein's abuse or friends of Epstein who may have witnessed or even participated in the abuse. Based on this information, I believed that the flight logs and related information was relevant information to prove the cases against Jeffrey Epstein and accordingly I pursued them in discovery.

20. In approximately November 2009, the existence of Scott Rothstein's Ponzi scheme became public knowledge. It was at that time that I, along with many other reputable attorneys at RRA, first became aware of Rothstein criminal scheme. At that time, I left RRA with several other RRA attorneys to form the law firm of Farmer Jaffe Weissing Edwards Fistos and Lehrman ("Farmer Jaffe"). I was thus with RRA for less than one year.

21. In July 2010, along with other attorneys at Farmer Jaffe and Professor Cassell, I reached favorable settlement terms for my three clients L.M., E.W., and Jane Doe in their lawsuits against Epstein.

22. On July 20, 2010, I received a letter from the U.S. Attorney's Office for the Southern District of Florida – the office responsible for prosecuting Rothstein's Ponzi scheme. The letter indicated that law enforcement agencies had determined that I was "a victim (or potential victim)" of Scott Rothstein's federal crimes. The letter informed me of my rights as a victim of Rothstein's federal crimes and promised to keep me informed about

subsequent developments in his prosecution. A copy of this letter is attached to this Affidavit. (A copy of the letter is attached to Statement of Undisputed Facts as Exhibit UU)

23. Jeffrey Epstein also filed a complaint with the Florida Bar against me. His complaint alleged that I had been involved in Rothstein's scheme and had thereby violated various rules of professional responsibility. The Florida Bar investigated and dismissed the complaint.

24. I have reviewed the Statement of Undisputed Facts filed contemporaneously with this Affidavit. Each of the assertions concerning what I learned, what I did, and the good faith beliefs formed by me in the course of my prosecutions of claims against Jeffrey Epstein as contained in the Statement of Undisputed Facts is true, and the foundations set out as support for my beliefs are true and correct to the best of my knowledge.

25. All actions taken by me in the course of my prosecution of claims against Jeffrey Epstein were based upon a good faith belief that they were reasonable, necessary, and ethically proper to fulfill my obligation to zealously represent the interests of my clients.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: 9/21, 2010

Bradley J. Edwards, Esq.

IN THE CIRCUIT COURT OF THE 15TH JUDICIAL CIRCUIT IN AND FOR PALM BEACH COUNTY, FLORIDA

Case No.: 50 2009CA 040800XXXXMBAG

JEFFREY EPSTEIN,

Plaintiff,

vs.

SCOTT ROTHSTEIN, individually, and
BRADLEY J. EDWARDS, individually,

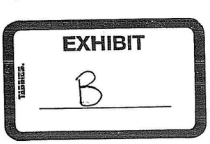
Defendants,
_____/

DEFENDANT BRADLEY J. EDWARDS'S
RENEWED MOTION FOR FINAL SUMMARY JUDGMENT

Defendant, Bradley J. Edwards, Esq., by and through his undersigned counsel and pursuant to Rule 1.510, Florida Rules of Civil Procedure, hereby moves for Final Summary Judgment and in support thereof states as follows:

I. INTRODUCTION

The pleadings and discovery taken to date show that there is no genuine issue as to any material facts and that Bradley J. Edwards, Esq. is entitled to summary judgment for all claims brought against him in Plaintiff Jeffrey Epstein's Second Amended Complaint. Not only is there an absence of competent evidence to demonstrate that Edwards participated in any fraud against Epstein, the evidence uncontrovertibly demonstrates the propriety of every aspect of Edwards' involvement in the prosecution of legitimate claims against Epstein. Epstein sexually abused three clients of Edwards – L.M., E.W., and Jane Doe – and Edwards properly and successfully



represented them in a civil action against Epstein. Nothing in Edwards's capable and competent representation of his clients can serve as the basis for a civil lawsuit against him. Allegations about Edwards's participation in or knowledge of the use of the civil actions against Epstein in a "Ponzi Scheme" are not supported by any competent evidence and could never be supported by competent evidence as they are entirely false.

A. Epstein's Complaint

Epstein's Second Amended Complaint essentially alleges that Epstein was damaged by Edwards, acting in concert with Scott Rothstein (President of the Rothstein Rosenfeldt Adler law firm ("RRA") where Edwards worked for a short period of time). Epstein appears to allege that Edwards joined Rothstein in the abusive prosecution of sexual assault cases against Epstein to "pump" the cases to Ponzi scheme investors. As described by Epstein, investor victims were told by Rothstein that three minor girls who were sexually assaulted by Epstein: L.M., E.W., and Jane Doe were to be paid up-front money to prevent those girls from settling their civil cases against Epstein. In Epstein's view, these child sexual assault cases had "minimal value" (Complaint & 42(h)), and Edwards's refusal to force his clients to accept modest settlement offers is claimed to breach some duty that Edwards owed to Epstein. Interestingly, Epstein never states that he actually made any settlement offers.

The supposed "proof" of the Complaint's allegations against Edwards includes Edwards's alleged contacts with the media, his attempts to obtain discovery from high-profile persons with whom Epstein socialized, and use of "ridiculously inflammatory" language in arguments in court. Remarkably, Epstein has filed such allegations against Edwards despite the fact that Epstein had sexually abused each of Edwards's clients and others while they were

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minors. Indeed, in discovery Epstein has asserted his Fifth Amendment privilege rather than answer questions about the extent of the sexual abuse of his many victims. Even more remarkably, since filing his suit against Edwards, Epstein has now settled the three cases Edwards handled for an amount that Epstein insisted be kept confidential. Without violating the strict confidentiality terms required by Epstein, the cases did not settle for the "minimal value" that Epstein suggested in his Complaint. Because Epstein relies upon the alleged discrepancy between the "minimal value" Epstein ascribed to the claims and the substantial value Edwards sought to recover for his clients, the settlement amounts Epstein voluntarily agreed to pay while these claims against Edwards were pending will be disclosed to the court in-camera.

B. Summary of the Argument

Bradley J. Edwards, Esq., is entitled to summary judgment on Epstein's frivolous claim for at least three separate reasons.

First, because Epstein has elected to hide behind the shield of his right against self incrimination to preclude his disclosing <u>any</u> relevant information about the criminal activity at the center of his claims, he is barred from prosecuting this case against Edwards. Under the well-established "sword and shield" doctrine, Epstein cannot seek damages from Edwards while at the same time asserting a Fifth Amendment privilege to block relevant discovery. His case must therefore be dismissed.

Second, all of Edwards' conduct in the prosecution of valid claims against Epstein is protected by the litigation privilege.

Third, and most fundamentally, Epstein's lawsuit should be dismissed because it is not only unsupported by but is also directly contradicted by all of the record evidence. From the

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beginning, Edwards diligently represented three victims of sexual assaults perpetrated by Epstein. As explained in detail below, each and every one of Edwards's litigation decisions was grounded in proper litigation judgment about the need to pursue effective discovery against Epstein, particularly in the face of Epstein's stonewalling tactics. Edwards's successful representation finally forced Epstein to settle and pay appropriate damages. Effective and proper representation of child victims who have been repeatedly sexually assaulted cannot form the basis of a separate, "satellite" lawsuit, and therefore Edwards is entitled to summary judgment on these grounds as well.

The truth is the record is entirely devoid of any evidence to support Epstein's claims and is completely and consistently corroborative of Edwards's sworn assertion of innocence. Put simply, Epstein has made allegations that have no basis in fact. To the contrary, his lawsuit was merely a desperate measure by a serial pedophile to prevent being held accountable for repeatedly sexually abusing minor females. Epstein's ulterior motives in filing and prosecuting this lawsuit are blatantly obvious. Epstein's behavior is another clear demonstration that he feels he lives above the law and that because of his wealth he can manipulate the system and pay for lawyers to do his dirty work - even to the extent of having them assert baseless claims against other members of the Florida Bar. Epstein's Second Amended Complaint against Edwards is nothing short of a far-fetched fictional fairy-tale with absolutely no evidence whatsoever to support his preposterous claims. It was his last ditch effort to escape the public disclosure by Edwards and his clients of the nature, extent, and sordid details of his life as a serial child molester. Edwards's Motion for Summary Judgment should be granted without equivocation.

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ARGUMENT

II. EDWARDS IS ENTITLED TO SUMMARY JUDGMENT ON EPSTEIN'S CLAIM BECAUSE THERE ARE NO MATERIAL DISPUTED FACTS AND THE UNDISPUTED FACTS ESTABLISH THAT EDWARDS'S CONDUCT COULD NOT POSSIBLY FORM THE BASIS OF ANY LIABILITY IN FAVOR OF EPSTEIN

A. The Summary Judgment Standard.

Rule 1.510(c), Florida Rules of Civil Procedure, provides that a court may enter summary judgment when the pleadings, depositions and factual showings reveal that there is no genuine issue of material fact and that the moving party is entitled to judgment as a matter of law. *See Snyder v. Cheezem Development Corp.*, 373 So. 2d 719, 720 (Fla. 2d DCA 1979); Rule 1.510(c), Fla. R. Civ. P. Once the moving party conclusively establishes that the nonmoving party cannot prevail, it is incumbent on the nonmoving party to submit evidence to rebut the motion for summary judgment. *See Holl v. Talcott,* 191 So. 2d 40, 43 (Fla. 1966). It is not enough for the opposing party merely to assert that an issue of fact does exist. *Fisel v. Wynns*, 667 So.2d 761, 764 (Fla.1996); *Landers v. Milton,* 370 So.2d 368, 370 (Fla.1979) (same).

Moreover, it is well-recognized that the non-moving party faced with a summary judgment motion supported by appropriate proof may not rely on bare, conclusory assertions found in the pleadings to create an issue and thus avoid summary judgment. Instead, the party must produce counter-evidence establishing a genuine issue of material fact. *See Bryant v. Shands Teaching Hospital and Clinics, Inc.,* 479 So.2d 165, 168 (Fla. 1st Dist. Ct. App. 1985); *see also Lanzner v. City of North Miami Beach,* 141 So.2d 626 (Fla. 3d Dist Ct. App. 1962) (recognizing that mere contrary allegations of complaint were not sufficient to preclude summary judgment on basis of facts established without dispute). Where the nonmoving party fails to

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present evidence rebutting the motion for summary judgment and there is no genuine issue of material fact, then entry of judgment is proper as a matter of law. *See Davis v. Hathaway*, 408 So. 2d 688, 689 (Fla. 2d Dist. Ct. App. 1982); *see also Holl*, 191 So. 2d at 43.

B. <u>Epstein's Claim Regarding Edwards Have Absolutely No Factual Basis</u>.

This is not a complicated case for granting summary judgment. To the contrary, this is a simple case for summary judgment because each and every one of Epstein's claim against Edwards lacks any merit whatsoever.[1]

1. Epstein's allegations regarding Edwards' involvement in Rothstein's "Ponzi Scheme" are unsupported and unsupportable because he was simply not involved in any such scheme.

a. Edwards Had No Involvement in the Ponzi Scheme.

The bulk of Epstein's claims against Edwards hinge on the premise that Edwards was involved in a Ponzi scheme run by Scott Rothstein. Broad allegations of wrongdoing on the part of Edwards are scattered willy-nilly throughout the complaint. None of the allegations provide any substance as to how Edwards actually assisted the Ponzi scheme, and allegations that he "knew or should have known" of its existence are based upon an impermissible pyramiding of inferences. In any event, these allegations all fail for one straightforward reason: Edwards was simply not involved in any Ponzi scheme. He has provided sworn testimony and an affidavit in support of that assertion, and there is not (and could never be) any contrary evidence.

Edwards has now been deposed at length in this case. As his deposition makes crystal clear, he had no knowledge of any fraudulent activity in which Scott Rothstein may have been

[1] A decision by the Court to grant summary judgment on Epstein's claims against Edwards would not affect Epstein's claims against Scott Rothstein. Epstein has already chosen to dismiss all of his claims against L.M., the only other defendant named in the suit.

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involved. *See, e.g.,* Edwards Depo. at 301-02 (Q: " . . . [W]ere you aware that Scott Rothstein was trying to market Epstein cases . . . ?" A: "No.").

Edwards has supplemented his deposition answers with an Affidavit that declares in no uncertain terms his lack of involvement in any fraud perpetrated by Rothstein. *See, e.g.,* Edwards Affidavit attached to Statement of Undisputed Material Facts as Exhibit "N" at ¶8-10, ¶20, ¶22-23. Indeed, no reasonable juror could find that Edwards was involved in the scheme, as Edwards joined RRA well after Rothstein began his fraud and would have been already deeply in debt. In fact, the evidence of Epstein's crimes is now clear, and Edwards's actions in this case were entirely in keeping with his obligation to provide the highest possible quality of legal representation for his clients to obtain the best result possible.

In view of this clear evidence rebutting all allegations against him, Epstein must now "produce counter-evidence establishing a genuine issue of material fact." *See Bryant v. Shands Teaching Hospital and Clinics, Inc.,* 479 So.2d 165, 168 (Fla. 1st Dist. Ct. App. 1985). Epstein cannot do this. Indeed, when asked at his deposition whether he had any evidence of Edwards's involvement, Epstein declined to answer, purportedly on attorney-client privilege grounds:

> Q. I want to know whether you have any knowledge of evidence that Bradley Edwards personally ever participated in devising a plan through which were sold purported confidential assignments of a structured payout settlement? . . .
> A. I'd like to answer that question by saying that the newspapers have reported that his firm was engaged in fraudulent structured settlements in order to fleece unsuspecting Florida investors. With respect to my personal knowledge, I'm unfortunately going to, today, but I look forward to at some point being able to disclose it, today I'm going to have to assert the attorney/client privilege.

See Deposition of Jeffrey Epstein, Mar. 17, 2010 (hereinafter "Epstein Depo.") at 67-68. Therefore summary judgment should be granted for Edwards on all claims involving any Ponzi scheme by Rothstein.

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b. **Epstein's Allegations of Negligence by Edwards are Unfounded and Not Actionable in Any Event.**

In his Second Amended Complaint Epstein recognizes at least the possibility that Edwards was not involved in any Rothstein Ponzi scheme. Therefore, seemingly as a fallback, Epstein alleges without explanation that Edwards "should have known" about the existence of this concealed Ponzi scheme. Among other problems, this fallback negligence position suffers the fatal flaw that it does not link at all to the intentional tort of abuse of process alleged in the complaint.

Epstein's negligence claim is also deficient because it simply fails to satisfy the requirements for a negligence cause of action:

> "Four elements are necessary to sustain a negligence claim: 1. A duty, or obligation, recognized by the law, requiring the [defendant] to conform to a certain standard of conduct, for the protection of others against unreasonable risks. 2. A failure on the [defendant's] part to conform to the standard required: a breach of the duty . . . . 3. A reasonably close causal connection between he conduct and the resulting injury. This is what is commonly known as 'legal cause,' or 'proximate cause,' and which includes the notion of cause in fact. 4. Actual loss or damage.

Curd v. Mosaic Fertilizer, LLC, ___ So.2d ___, 2010 WL 2400384 at *9 (Fla. 2010). Epstein does not allege a particular duty on the part of Edwards that has been breached. Nor does Epstein explain how any breach of the duty might have proximately caused him actual damages. Summary judgment is therefore appropriate for these reasons as well.

Finally, for the sake of completeness, it is worth noting briefly that no reasonable jury could find Edwards to have been negligent in failing to anticipate that a managing partner at his law firm would be involved in an unprecedented Ponzi scheme. Scott Rothstein deceived not

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only Edwards but also more than 60 other reputable lawyers at a major law firm. *Cf. Sun Sentinel, Fort* Lauderdale, Dec. 11, 2009, 2009 WLNR 25074193 at *1 ("Sure, some outlandish John Grisham murder plot[s] sound far-fetched. But if you asked me a few months ago if Scott Rothstein was fabricating federal court orders and forging a judge's signature on documents to allegedly fleece his friends, as federal prosecutors allege, I would have said that was far-fetched, too."). No reasonable lawyer could have expected that a fellow member of the bar would have been involved in such a plot. Nobody seemed to know of Rothstein's Ponzi scheme, not even his best friends, or the people he did business with on a daily basis, or even his wife. Many of the attorneys at RRA had been there for years and knew nothing. Edwards was a lawyer at RRA for less than 8 months and had very few personal encounters with Rothstein during his time at the firm, yet Epstein claims that he should have known of Rothstein's intricate Ponzi scheme. No doubt for this reason the U.S. Attorney's Office has now listed Edwards as a "victim" of Rothstein's crimes. *See* Statement of Undisputed Facts filed contemporaneously.

Epstein's Complaint does not offer any specific reason why a jury would conclude that Edwards was negligent, and he chose not to offer any explanation of his claim at his deposition. Accordingly, Edwards is entitled to summary judgment to the extent the claim against him is somehow dependent upon his negligence in failing to discover Rothstein's Ponzi scheme.

2. Edwards is Entitled to Summary Judgment to the Extent the Claim Against Him is Dependent on Allegations Regarding "Pumping the Cases" Because He Was Properly Pursuing the Interests of His Three Clients Who Had Been Sexually Abused by Epstein.

Epstein alleges that Edwards somehow improperly enhanced the value of the three civil cases he had filed against Epstein. Edwards represented three young women – L.M., E.W., and Jane Doe – by filing civil suits against Epstein for his sexual abuse of them while they were

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minors. Epstein purports to find a cause of action for this by alleging that Edwards somehow was involved in "'pumping' these three cases to investors."

As just explained, to the extent that Epstein is alleging that Edwards somehow did something related to the Ponzi scheme, those allegations fail for the simple reason that Edwards was not involved in any such scheme. Edwards, for example, could not have possibly "pumped" the cases to investors when he never participated in any communication with investors.

Epstein's "pumping" claims, however, fail for an even more basic reason: Edwards was entitled – indeed ethically obligated as an attorney – to secure the maximum recovery for his clients during the course of his legal representation. As is well known, "[a]s an advocate, a lawyer zealously asserts the client's position under the rules of the adversary system." Fla. Rules of Prof. Conduct, Preamble. Edwards therefore was required to pursue (unless otherwise instructed by his clients) a maximum recovery against Epstein. Edwards, therefore, cannot be liable for doing something that his ethical duties as an attorney required.[2]

Another reason that Epstein's claims that Edwards was "pumping" cases for investors fails is that Edwards filed all three cases almost a year before he was hired by RRA or even knew of Scott Rothstein. Epstein makes allegations that the complaints contained sensational allegations for the purposes of luring investors; however, language in the complaints remained virtually unchanged from the first filing in 2008 and from the overwhelming evidence the Court can see for itself that all of the facts alleged by Edwards in the complaints were true.

Epstein ultimately paid to settle all three of the cases Edwards filed against him for more money than he paid to settle any of the other claims against him. At Epstein's request, the terms

[2] In a further effort to harass Edwards, Epstein also filed a bar complaint with the Florida Bar against Edwards. The Florida Bar has dismissed that complaint. *See* Statement of Undisputed Facts.

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of the settlement were kept confidential. The sum that he paid to settle all these cases is therefore not filed with this pleading and will be provided to the court for in-camera review. Epstein chose to make this payment as the result of a federal court ordered mediation process, which he himself sought (over the objection of Jane Doe, Edwards' client in federal court) in an effort to resolve the case. *See* Defendant's Motion for Settlement Conference, or in the Alternative, Motion to Direct Parties back to Mediation, *Doe v. Epstein*, No. 9:08-CV-80893 (S.D. Fla. June 28, 2010) (Marra, J.) (doc. #168) attached hereto as Exhibit "A". Notably, Epstein sought this settlement conference – and ultimately made his payments as a result of that conference - in July 2010, more than seven months after he filed this lawsuit against Edwards. Accordingly, Epstein could not have been the victim of any scheme to "pump" the cases against him, because he never paid to settle the cases until well after Edwards had left RRA and had severed all connection with Scott Rothstein (December 2009).

In addition, if Epstein had thought that there was some improper coercion involved in, for example, Jane Doe's case, his remedy was to raise the matter before Federal District Court Judge Kenneth A. Marra who was presiding over the matter. Far from raising any such claim, Epstein simply chose to settle that case. He is therefore now barred by the doctrine of res judicata from somehow re-litigating what happened in (for example) the Jane Doe case. "The doctrine of res judicata makes a judgment on the merits conclusive 'not only as to every matter which was offered and received to sustain or defeat the claim, but as to every other matter which might with propriety have been litigated and determined in that action." *AMEC Civil, LLC v. State Dept. of Transp.*, ___ So.2d ___, 2010 WL 1542634 at *2 (Fla. 1st Dist. Ct. App. 2010) (*quoting Kimbrell v. Paige*, 448 So.2d 1009, 1012 (Fla. 1984). Obviously, any question of improper "pumping" of a

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particular case could have been resolved *in that very case* rather than now re-litigated in satellite litigation.

3. Edwards is Entitled to Summary Judgment on the Claim of Abuse of Process Because He Acted Properly Within the Boundaries of the Law in Pursuit of the Legitimate Interests of his Clients.

Epstein's Second Amended Complaint raises several claims of "abuse of process." An abuse of process claim requires proof of three elements: "(1) that the defendant made an illegal, improper, or perverted use of process; (2) that the defendant had ulterior motives or purposes in exercising such illegal, improper, or perverted use of process; and (3) that, as a result of such action on the part of the defendant, the plaintiff suffered damage." *S & I Investments v. Payless Flea Market, Inc.*, 36 So.3d 909, 917 (Fla. 4th Dist. Ct. App. 2010) (internal citation omitted). In fact, this Court is very familiar with this cause of action, as Edwards has correctly stated this cause in his counterclaim against Epstein. Edwards is entitled to summary judgment because Epstein cannot prove these elements.

The first element of an abuse of process claim is that a defendant made "an illegal, improper, or perverted use of process." On the surface, Epstein's Complaint appears to contain several allegations of such improper process. On examination, however, each of these allegations amounts to nothing other than a claim that Epstein was unhappy with some discovery proceeding, motion or argument made by Edwards. This is not the stuff of an abuse of process claim, particularly where Epstein fails to allege that he was required to do something as the result of Edwards' pursuit of the claims against him. *See Marty v. Gresh*, 501 So.2d 87, 90 (Fla. 1st Dist. Ct. App. 1987) (affirming summary judgment on an abuse of process claim where "appellant's lawsuit caused appellee to do nothing against her will").

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In any event, none of the allegations of "improper" process can survive summary judgment scrutiny, because every action Edwards took was entirely proper and reasonably calculated to lead to the successful prosecution of the pending claims against Epstein as detailed in Edwards' Affidavit.

Epstein also fails to meet the second element of an abuse of process claim: that Edwards had some sort of ulterior motive. The case law is clear that on an abuse of process claim a "plaintiff must prove that the process was used for an immediate purpose other than that for which it was designed." *S&I Investments v. Payless Flea Market, Inc.*, 36 So.3d 909, 917 (Fla. 4th Dist. Ct. App. 2010) (*citing Biondo v. Powers*, 805 So.2d 67, 69 (Fla. 4th Dist. Ct. App. 2002). As a consequence, "[w]here the process was used to accomplish the result for which it was intended, regardless of an incidental or concurrent motive of spite or ulterior purpose, there is no abuse of process." *Id.* (internal quotation omitted). Here, Edwards has fully denied any improper motive, *See* Statement of Undisputed Facts, and Epstein has no evidence of any such motivation. Indeed, it is revealing that Epstein chose not to ask even a single question about this subject during the deposition of Edwards. In addition, all of the actions that Epstein complains about were in fact used for the immediate purpose of furthering the lawsuits filed by L.M., E.W., and Jane Doe. In other words, these actions all were both intended to accomplish and, in fact, successfully "accomplished the results for which they were intended" -- whether it was securing additional discovery or presenting a legal issue to the court handling the case or ultimately maximizing the recovery of damages from Epstein on behalf of his victims. Accordingly, Edwards is entitled to summary judgment on any claim that he abused process for this reason as well.

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4. Edwards is Entitled to Summary Judgment to the Extent His Claim is Based On Pursuit of Discovery Concerning Epstein's Friends Because All Such Efforts Were Reasonably Calculated to Lead to Relevant and Admissible Testimony About Epstein's Abuse of Minor Girls.

Epstein has also alleged that Edwards improperly pursued discovery from some his close friends. Such discovery, Epstein claims, was improper because Edwards knew that these individuals lacked any discoverable information about the sexual assault cases against Epstein.

Here again, Edwards is entitled to summary judgment, as each of the friends of Epstein were reasonably believed to possess discoverable information. The undisputed facts show the following with regard to each of the persons raised in Epstein's complaint:

- With regard to Donald Trump, Edwards had sound legal basis for believing Mr. Trump had relevant and discoverable information. *See* Statement of Undisputed Facts.
- With regard to Alan Dershowitz (Harvard Law Professor), Edwards had sound legal basis for believing Mr. Dershowitz had relevant and discoverable information. *See* Statement of Undisputed Facts.
- With regard to former President Bill Clinton, Edwards had sound legal basis for believing former President Clinton had relevant and discoverable information. *See* Statement of Undisputed Facts.
- With regard to former Sony Record executive Tommy Mottola, Edwards was not the attorney that noticed Mr. Mottola's deposition. *See* Statement of Undisputed Facts.
- With regard to illusionist David Copperfield, Edwards had sound legal basis for believing Mr. Copperfield had relevant and discoverable information. *See* Statement of Undisputed Facts.
- With regard to former New Mexico Governor Bill Richardson, Edwards had sound legal basis for naming Former New Mexico Governor Bill Richardson on his witness list. *See* Statement of Undisputed Facts.

It is worth noting that the standard for discovery is a very liberal one. To notice someone for a deposition, of course, it is not required that the person deposed actually end up producing

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admissible evidence. Otherwise, every deposition that turned out to be a false alarm would lead to an "abuse of process" claim. Moreover, the rules of discovery themselves provide that a deposition need only be "reasonably calculated to *lead to* the discovery of admissible evidence." Fla. R. Civ. P. 1.280(b) (emphasis added).

Moreover, the discovery that Edwards pursued has to be considered against the backdrop of Epstein's obstructionist tactics. As the Court is aware, in both this case and all other cases filed against him, Epstein has asserted his Fifth Amendment privilege rather than answer any substantive questions. Epstein has also helped secure attorneys for his other household staff who assisted in the process of recruiting the minor girls, who in turn also asserted their Fifth Amendment rights rather than explain what happened behind closed doors in Epstein's mansion in West Palm Beach. *See* Statement of Undisputed Facts. It is against this backdrop that Edwards followed up on one of the only remaining lines of inquiry open to him: discovery aimed at Epstein's friends who might have been in a position to corroborate the fact that Epstein was sexually abusing young girls.

In the context of the sexual assault cases that Edwards had filed against Epstein, any act of sexual abuse had undeniable relevance to the case – even acts of abuse Epstein committed against minor girls other than L.M., E.W., or Jane Doe. Both federal and state evidence rules make acts of child abuse against other girls admissible in the plaintiff's case in chief as proof of "modus operandi" or "motive" or "common scheme or plan." *See* Fed. R. Evid. 415 (evidence of other acts of sexual abuse automatically admissible in a civil case); Fla. Stat. Ann. 90.404(b) (evidence of common scheme admissible); *Williams v. State*, 110 So.2d 654 (Fla. 1959) (other acts of potential sexual misconduct admissible).

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A second reason exists for making discovery of Epstein's acts of abuse of other minor girls admissible. Juries considering punitive damages issues are plainly entitled to consider "the existence and frequency of similar past conduct." *TXO Production Corp. v. Alliance Resources Corp.*, 509 U.S. 443, 462 n.28 (1993). This is because the Supreme Court recognizes "that a recidivist may be punished more severely than a first offender . . . [because] repeated misconduct is more reprehensible than an individual instance of malfeasance." *BMW of North America, Inc. v. Gore*, 517 U.S. 559, 577 (1996) (supporting citations omitted). In addition, juries can consider other similar acts evidence as part of the deterrence calculation in awarding punitive damages, because "evidence that a defendant has repeatedly engaged in prohibited conduct while knowing . . . that it was unlawful would provide relevant support for an argument that strong medicine is required to cure the defendant's disrespect for the law." *Id.* at 576-77. In the cases Edwards filed against Epstein, his clients were entitled to attempt to prove that Epstein "repeatedly engaged in prohibited conduct" – i.e., because he was a predatory pedophile, he sexually assaulted dozens and dozens of minor girls. The discovery of Epstein's friends who might have had direct or circumstantial evidence of other acts of sexual assault was accordingly entirely proper. Edwards is therefore entitled summary judgment to the extent his claim is based on efforts by Edwards to obtain discovery of Epstein's friends.

III. EPSTEIN'S LAWSUIT MUST BE DISMISSED BECAUSE OF HIS REFUSAL TO PARTICIPATE IN REASONABLE DISCOVERY.

As is readily apparent from the facts of this case, Epstein has filed a lawsuit but then refused to allow any real discovery about the merits of his case. Instead, when asked hard questions about whether he has any legitimate claim at all, Epstein has hidden behind the Fifth

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Amendment. As a result, under the "sword and shield doctrine" widely recognized in Florida caselaw, his suit must be dismissed.

"[T]he law is well settled that a plaintiff is not entitled to both his silence and his lawsuit." *Boys & Girls Clubs of Marion County, Inc. v. J.A.*, 22 So.3d 855, 856 (Fla. 5th Dist. Ct. App. 2009) (Griffin, J., concurring specially). Thus, "a person may not seek affirmative relief in a civil action and then invoke the fifth amendment to avoid giving discovery, using the fifth amendment as both a 'sword and a shield.'" *DePalma v. DePalma*, 538 So.2d 1290, 1290 (Fla. 4th Dist. Ct. App. 1989) (*quoting DeLisi v. Bankers Insurance Co.*, 436 So.2d 1099 (Fla. 4th Dist. Ct. App. 1983)). Put another way, "[a] civil litigant's fifth amendment right to avoid self-incrimination may be used as a shield but not a sword. This means that a plaintiff seeking affirmative relief in a civil action may not invoke the fifth amendment and refuse to comply with the defendant's discovery requests, thereby thwarting the defendant's defenses." *Rollins Burdick Hunter of New York, Inc. v. Euroclassic Limited, Inc.*, 502 So. 2d 959 (Fla. 3rd Dist. Court App. 1983).

Here, Epstein is trying to do precisely what the "well settled" law forbids. Specifically, he is trying to obtain "affirmative relief" – i.e., forcing Edwards to pay money damages – while simultaneously precluding Edwards from obtaining legitimate discovery at the heart of the allegations that form the basis for the relief Epstein is seeking. As recounted more fully in the statement of undisputed facts, Epstein has refused to answer such basic questions about his lawsuit as:

- "Specifically what are the allegations against you which you contend Mr. Edwards ginned up?"
- "Well, which of Mr. Edwards' cases do you contend were fabricated?"

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- "Is there anything in L.M.'s Complaint that was filed against you in September of 2008 which you contend to be false?"
- "I would like to know whether you ever had any physical contact with the person referred to as Jane Doe in that [federal] complaint?"
- "Did you ever have any physical contact with E.W.?"
- "What is the actual value that you contend the claim of E.W. against you has?"

The matters addressed in these questions are the central focus of Epstein's claims against Edwards. Epstein's refusal to answer these and literally every other substantive question put to him in discovery has deprived Edwards of even a basic understanding of the evidence alleged to support claims against him. Moreover, by not offering any explanation of his allegations, Epstein is depriving Edwards of any opportunity to conduct third party discovery and opportunity to challenge Epstein's allegations.

It is the clear law that "the chief purpose of our discovery rules is to assist the truth-finding function of our justice system and to avoid trial by surprise or ambush," *Scipio v. State,* 928 So.2d 1138 (Fla.2006), and "full and fair discovery is essential to these important goals," *McFadden v. State*, 15 So.3d 755, 757 (Fla. 4th Dist. Ct. App. 2009). Accordingly, it is important for the Court to insure "not only compliance with the technical provisions of the discovery rules, but also adherence to the purpose and spirit of those rules in both the criminal and civil context." *McFadden*, 15 So.3d at 757. Epstein has repeatedly blocked "full and fair discovery," requiring dismissal of his claim against Edwards.

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IV. EDWARDS IS ENTITLED TO ADVERSE INFERENCES FROM EPSTEIN'S INVOCATION OF THE FIFTH AMENDMENT AND THEREFORE TO SUMMARY JUDGMENT ON EPSTEIN'S CLAIM.

Edwards is entitled to summary judgment on the claim against him for a second and entirely independent reason: Epstein's repeated invocations of the Fifth Amendment raise adverse inferences against him that leave no possibility that a reasonable factfinder could reach a verdict in his favor. In ruling on a summary judgment motion, the court must fulfill a "gatekeeping function" and should ask whether "a *reasonable* trier of fact could possibly" reach a verdict in favor of the plaintiff. *Willingham v. City of Orlando*, 929 So.2d 43, 48 (Fla. 5th Dist. Ct. App. 2006) (emphasis added). Given all of the inferences that are to be drawn against Epstein, no reasonable finder of fact could conclude that Epstein was somehow the victim of improper civil lawsuits filed against him. Instead, a reasonable finder of fact could only find that Epstein was a serial molester of children who was being held accountable through legitimate suits brought by Edwards and others on behalf of the minor girls that Epstein victimized.

"[I]t is well-settled that the Fifth Amendment does not forbid adverse inferences against parties to civil actions when they refuse to testify in response to probative evidence offered against them." *Baxter v. Palmigiano,* 425 U.S. 308, 318 (1976); *accord Vasquez v. State*, 777 So.2d 1200, 1203 (Fla. App. 2001). The reason for this rule "is both logical and utilitarian. A party may not trample upon the rights of others and then escape the consequences by invoking a constitutional privilege – at least not in a civil setting." *Fraser v. Security and Inv. Corp.*, 615 So.2d 841, 842 (Fla. 4th Dist. Ct. App. 1993). And, in the proper circumstances, "'Silence is often evidence of the most persuasive character.'" *Fraser v. Security and Inv. Corp.*, 615 So.2d

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841, 842 (Fla. 4th Dist. Ct. App. 1993) (*quoting United States ex rel. Bilokumsky v. Tod,* 263 U.S. 149, 153-154 (1923) (Brandeis, J.).

In the circumstances of this case, a reasonable finder of fact would have "evidence of the most persuasive character" from Epstein's repeated refusal to answer questions propounded to him. To provide but a few examples, here are questions that Epstein refused to answer and the reasonable inference that a reasonable finder of fact would draw:

- Question not answered: "Specifically what are the allegations against you which you contend Mr. Edwards ginned up?" Reasonable inference: No allegations against Epstein were ginned up.

- Question not answered: "Well, which of Mr. Edwards' cases do you contend were fabricated?" Reasonable inference: No cases filed by Edwards against Epstein were fabricated.

- Question not answered: "Did sexual assaults ever take place on a private airplane on which you were a passenger?" Reasonable inference: Epstein was on a private airplane while sexual assaults were taking place.

- Question not answered: "How many minors have you procured for prostitution?" Reasonable inference: Epstein has procured multiple minors for prostitution.

- Question not answered: "Is there anything in L.M.'s Complaint that was filed against you in September of 2008 which you contend to be false?" Reasonable inference: Nothing in L.M.'s complaint filed in September of 2008 was false – i.e., as alleged in L.M.'s complaint, Epstein repeatedly sexually assaulted her while she was a minor and she was entitled to substantial compensatory and punitive damages as a result.

- Question not answered: "I would like to know whether you ever had any physical contact with the person referred to as Jane Doe in that [federal] complaint?" Reasonable inference: Epstein had physical contact with minor Jane Doe as alleged in her federal complaint.

- Question not answered: "Did you ever have any physical contact with E.W.?" Reasonable inference: Epstein had physical contact with minor E.W. as alleged in her complaint.

- Question not answered: "What is the actual value that you contend the claim of

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E.W. against you has?" Reasonable inference: E.W.'s claim against Epstein had substantial actual value.

Without repeating each and every invocation of the Fifth Amendment that Epstein has made and the reasonable inferences to be drawn from those invocations of privilege, the big picture is unmistakably clear: No reasonable finder of fact could rule in Epstein's favor on his claims against Edwards. Accordingly, Edwards is entitled to summary judgment based on the Fifth Amendment inferences that the jury would draw.

The inferences against Epstein are not limited to those arising from his privilege assertions. Epstein's guilt is also reasonably inferred from his harassment of, intimidation of, efforts to exercise control over, and limitation of access to witnesses who might testify against him.

Epstein's efforts to intimidate his victims support the inference that Epstein knew that they were going to provide compelling testimony against him. The evidence that Epstein tampered with witnesses (later designated as his accomplices and co-conspirators) will be admissible to demonstrate his consciousness of guilt. "[I]t is precisely because of the egregious nature of such conduct that the law expressly permits the jury to make adverse inferences from a party's efforts to intimidate witnesses . . . ." *Jost v. Ahmad*, 730 So.2d 708, 711 (Fla. 2nd Dist. Ct. App. 1998) (internal quotation omitted). To be clear, Epstein's attempt to tamper with witnesses is "not simply admissible as impeachment evidence of the tampering party's credibility. The opposing party is entitled to introduce facts regarding efforts to intimidate a witness as *substantive evidence*." *Id.* at 711 (emphasis in original) (internal citation omitted). This substantive evidence of Epstein's witness intimidation provides yet another reason why no reasonable jury could find in favor of his claims against Edwards.

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V. EDWARDS IS ENTITLED TO SUMMARY JUDGMENT ON THE BASIS OF HIS AFFIRMATIVE DEFENSE OF PRIVILEGE

Absolute immunity must be afforded any act occurring during course of judicial proceeding, regardless of whether act involves defamatory statement or other tortious behavior, such as tortious interference with business relationship, so long as act has some relationship to proceeding. *See Levin, Middlebrooks, Mabie, Thomas, Mayes & Mitchell, P.A. v. U.S. Fire Ins. Co.*, 639 So. 2d 606 (Fla. 1994). The immunity afforded to statements made during the course of a judicial proceeding extends not only to the parties in a proceeding but to judges, witnesses, and counsel as well. *Id.* The litigation privilege applies in all causes of action, whether for common-law torts or statutory violations. *See Echevarria, McCalla, Raymer, Barrett & Frappier v. Cole*, 950 So. 2d 380 (Fla. 2007). Defamatory statements made by lawyer while interviewing a witness in preparation for and connected to pending litigation are covered by the absolute immunity conferred by the litigation privilege. *See DelMonico v. Traynor*, 50 So. 3d 4 (Fla. Dist. Ct. App. 4th Dist. 2010), review granted, 47 So. 3d 1287 (Fla. 2010). The privilege extends to statements in judicial proceedings or those "necessarily preliminary thereto. *See Stewart v. Sun Sentinel Co.*, 695 So.2d 360 (Fla. 4th DCA 1997)(an attorney's delivery of a copy of a notice of claim to a reporter, which notice was a required filing prior to instituting suit, was protected by absolute immunity).

CONCLUSION

For all the foregoing reasons, defendant, the Court should grant defendant Bradley J. Edwards, Esq., summary judgment in his favor on the only remaining claim filed against him by plaintiff Jeffrey Epstein, and any other relief that the Court deems just and proper.

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on November 3rd, 2011 a copy of the foregoing has been served via Fax and U.S. Mail to all those on the attached service list.

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IN THE CIRCUIT COURT OF THE
FIFTEENTH JUDICIAL CIRCUIT, IN AND
FOR PALM BEACH COUNTY, FLORIDA

CASE NO.: 502009CA040800XXXXMBAG

JEFFREY EPSTEIN,

Plaintiff(s),

vs.

SCOTT ROTHSTEIN, individually,
BRADLEY J. EDWARDS, individually, and
L.M., individually,

Defendant(s).
_____/

COUNTER-PLAINTIFF, EDWARDS' SECOND RENEWED MOTION FOR LEAVE TO ASSERT CLAIM FOR PUNITIVE DAMAGES

Counter-plaintiff, BRADLEY J. EDWARDS, moves this Honorable Court for entry of an Order granting him leave to assert a claim for punitive damages against the Counter-defendant, JEFFREY EPSTEIN, and in support thereof would show that the evidence summarized herein satisfies the statutory prerequisites for the assertion of a punitive damage claim. Specifically, the evidence establishes that EPSTEIN's Complaint against EDWARDS;

1. was filed in the total absence of evidence to support any allegation of wrongdoing on the part of EDWARDS;
2. was filed in the total absence of evidence that EPSTEIN had sustained damage as a consequence of any misconduct other than his own well-established criminal enterprise;
3. was filed in the absence of any intention to meet his own obligation to provide relevant and material discovery;

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C

4. was filed for the sole purpose of attempting to intimidate both EDWARDS and EDWARDS' clients and others into abandoning their legitimate claims against EPSTEIN.

APPLICABLE LAW

To plead a claim for punitive damages, the claimant must show a "reasonable basis" for the recovery of such damages. *See* Fla.R.Civ.P. 1.190(f); *see also Globe Newspaper Co. v. King,* 658 So.2d 518, 520 (Fla. 1995). The showing required to amend is minimal. As stated in *State of Wis. Inv. v. Plantation Square Assoc.,* 761 F. Supp. 1569, 1580 (S.D. Fla. 1991):

> [T] he court believes it must ultimately be a lesser standard than that required for summary judgment. Though the burden is on [the plaintiff] to survive a §768.72 challenge of insufficiency, *see Will v. Systems Engineering Consultants,* 554 So.2d 591, 592 (Fla. 3rd DCA 1989), the standard of proof required to assert Plaintiff's punitive claim must be lower than that needed to survive a summary adjudication on its merits. As the Florida courts have noted, a §768.72 challenge more closely resembles a motion to dismiss that additionally requires an evidentiary proffer and places the burden of persuasion on the plaintiff. *Id.* In considering a motion to dismiss, factual adjudication is inappropriate as all facts asserted—or here, reasonably established—by the plaintiff are to be taken as true. *Conley v. Gibson,* 355 U.S. 41, at 45-46, 78 S. Ct. 99, at 101-102, 2 L.Ed. 2d 80, 1581 at 84. As such, the court has given recognition only to those assertions of the defendants which would show Plaintiff's factual bases to be patently false or irrelevant, and has paid no heed whatsoever to the defendants' alternative evidentiary proffers.

State of Wis. Inv., 761 F. Supp. At 1580; *see also Dolphin Cove Assn. v. Square D. Co.,* 616 So. 2d 553 (Fla. 2d DCA 1993) ("Prejudging the evidence is not a proper vehicle for the court's denial of the motion to amend" to assert punitive damages claim).

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Section 768.72 provides for the amendment of a complaint either through evidence in the record *or* "proffered by the claimant." As the statute suggests, a proffer of evidence in support of a punitive damage claim is sufficient and a formal evidentiary hearing is not required. *See Strasser v. Yalmanchi,* 677 So.2d 22, 23 (Fla. 4th DCA 1996), *rev. dismissed,* 699 So.2d 1372 (Fla. 1997); *Solis v. Calvo,* 689 So.2d 366, 369, n.2 (Fla. 3d DCA 1997). In fact, a hearing is not even required provided the trial court identifies the filings of the parties and indicates that its decision to grant the motion is based upon a review of the file and the respective documents filed.

The United States District Court for the Middle District of Florida has spoken clearly on the nature of a proffer in support of a motion to amend to assert a claim for punitive damages in *Royal Marco Point I Condo. Ass'n, Inc. v. QBE Ins. Corp.*, 2010 WL 2609367 (M.D. Fla. June 30, 2010). As the Court stated:

> It is important to emphasize, at the outset, the limited nature of the review a court may undertake in considering the sufficiency of an evidentiary proffer under Fla. Stat. §768.72. Courts reviewing such proffers have recognized that "a 'proffer' according to traditional notions of the term, connotes merely an 'offer' of evidence and neither the term standing alone nor the statute itself calls for an adjudication of the underlying veracity of that which is submitted, much less for countervailing evidentiary submissions." *Estate of Despain v. Avante Group, Inc.,* 900 So.2d 637, 642 (Fla. 5th DCA 2005) (quoting *State of Wisconsin Investment Board v. Plantation Square Associates, Ltd.,* 761 F. Supp. 1569, 1581 n. 21 (S.D. Fla. 1991)).
>
> Therefore, "an evidentiary hearing where witnesses testify and evidence is offered and scrutinized under the pertinent evidentiary rules, as in a trial, is neither contemplated nor mandated by the statute in order to determine whether a reasonable basis has been established to plead punitive damages." *Id.* (collecting cases).

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> It is thus neither necessary nor appropriate for a court to make evidentiary rulings, weigh rebuttal evidence, or engage in credibility determinations in considering the sufficiency of the proffer.
>
> "...a proffer should be evaluated by standards akin to those governing a motion to dismiss, where the truth of the plaintiff's allegations are assumed, and not the more rigorous summary judgment standard, where the opposing party must show that there is sufficient admissible evidence in the record to support a reasonable jury finding in his favor."

I. INTRODUCTION

The pleadings and discovery taken to date as confirmed by Epstein's voluntary dismissal of all claims brought by him against Bradley J. Edwards, show that there is an absence of competent evidence to demonstrate that Edwards participated in any fraud against Epstein, show the propriety of every aspect of Edwards' involvement in the prosecution of legitimate claims against Epstein, and further support the conclusion that Epstein sued Edwards out of malice and for the purpose of intending to intimidate Edwards and Edwards' clients into abandoning or compromising their legitimate claims against Epstein. Epstein sexually abused three clients of Edwards – L.M., E.W., and Jane Doe – and Edwards properly and successfully represented them in a civil action against Epstein. Nothing in Edwards's capable and competent representation of his clients could serve as the basis for a civil lawsuit against him. Allegations about Edwards's participation in or knowledge of the use of the civil actions against Epstein in a "Ponzi Scheme" were never supported by probable cause or any competent evidence and could never be supported by competent evidence as they are entirely false.

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A. Epstein's Complaint

Epstein's Second Amended Complaint essentially alleged that Epstein was damaged by Edwards, acting in concert with Scott Rothstein (President of the Rothstein Rosenfeldt Adler law firm ("RRA") where Edwards worked for a short period of time). Epstein appeared to allege that Edwards joined Rothstein in the abusive prosecution of sexual assault cases against Epstein to "pump" the cases to Ponzi scheme investors. As described by Epstein, investor victims were told by Rothstein that three minor girls who were sexually assaulted by Epstein: L.M., E.W., and Jane Doe were to be paid up-front money to prevent those girls from settling their civil cases against Epstein. In Epstein's view, these child sexual assault cases had "minimal value" (Complaint & 42(h)), and Edwards's refusal to force his clients to accept modest settlement offers was claimed to breach some duty that Edwards owed to Epstein. Interestingly, Epstein never states that he actually made any settlement offers.

The supposed "proof" of the Complaint's allegations against Edwards includes Edwards's alleged contacts with the media, his attempts to obtain discovery from high-profile persons with whom Epstein socialized, and use of "ridiculously inflammatory" language in arguments in court. Remarkably, Epstein has filed such allegations against Edwards despite the fact that Epstein had sexually abused each of Edwards's clients and others while they were minors. Indeed, in discovery Epstein has asserted his Fifth Amendment privilege rather than answer questions about the extent of the sexual abuse of his many victims. Even more remarkably, since filing his suit against Edwards, Epstein settled the three cases Edwards handled for an amount that Epstein insisted be kept confidential. Without violating the strict

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confidentiality terms required by Epstein, the cases did not settle for the "minimal value" that Epstein suggested in his Complaint. Because Epstein relies upon the alleged discrepancy between the "minimal value" Epstein ascribed to the claims and the substantial value Edwards sought to recover for his clients, the settlement amounts Epstein voluntarily agreed to pay while these claims against Edwards were pending will be disclosed to the court in-camera.

B. Summary of the Argument

The claims against Bradley J. Edwards, Esq., were frivolous for at least three separate reasons.

First, because Epstein elected to hide behind the shield of his right against self-incrimination to preclude his disclosing <u>any</u> relevant information about the criminal activity at the center of his claims, he was barred from prosecuting his case against Edwards. Under the well-established "sword and shield" doctrine, Epstein could not legitimately seek damages from Edwards while at the same time asserting a Fifth Amendment privilege to block relevant discovery. His case was therefore subject to summary judgment and on the eve of the hearing seeking that summary judgment Epstein effectively conceded that fact by voluntarily dismissing his claims.

Second, all of Edwards' conduct in the prosecution of valid claims against Epstein was protected by the litigation privilege, a second absolute legal bar to Epstein's claims effectively conceded by his voluntary dismissal.

Third, and most fundamentally, Epstein's lawsuit was not only unsupported by both the applicable law, it was based on unsupported factual allegations directly contradicted by all of the

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record evidence. From the beginning, Edwards diligently represented three victims of sexual assaults perpetrated by Epstein. As explained in detail below, each and every one of Edwards's litigation decisions was grounded in proper litigation judgment about the need to pursue effective discovery against Epstein, particularly in the face of Epstein's stonewalling tactics. Edwards's successful representation finally forced Epstein to settle and pay appropriate damages. Effective and proper representation of child victims who have been repeatedly sexually assaulted cannot form the basis of a separate, "satellite" lawsuit, and therefore Edwards is entitled to summary judgment on these grounds as well.

The truth is the record is entirely devoid of any evidence to support Epstein's claims and is completely and consistently corroborative of Edwards's sworn assertion of innocence. Put simply, Epstein made allegations that have no basis in fact. To the contrary, his lawsuit was merely a desperate measure by a serial pedophile to prevent being held accountable for repeatedly sexually abusing minor females. Epstein's ulterior motives in filing and prosecuting this lawsuit are blatantly obvious. Epstein's behavior is another clear demonstration that he feels he lives above the law and that because of his wealth he can manipulate the system and pay for lawyers to do his dirty work - even to the extent of having them assert baseless claims against other members of the Florida Bar. Every one of Epstein's Complaints against Edwards was nothing short of a far-fetched fictional fairy-tale with absolutely no evidence whatsoever to support his preposterous claims. It was his last ditch effort to escape the public disclosure by Edwards and his clients of the nature, extent, and sordid details of Epstein's life as a serial child molester.

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ARGUMENT

II. THE RECORD AND PROFFERED EVIDENCE ESTABLISHES THAT EDWARDS'S CONDUCT COULD NOT POSSIBLY FORM THE BASIS OF ANY LIABILITY IN FAVOR OF EPSTEIN

A. The Summary Judgment Standard.

Rule 1.510(c), Florida Rules of Civil Procedure, provides that a court may enter summary judgment when the pleadings, depositions and factual showings reveal that there is no genuine issue of material fact and that the moving party is entitled to judgment as a matter of law. *See Snyder v. Cheezem Development Corp.*, 373 So. 2d 719, 720 (Fla. 2d DCA 1979); Rule 1.510(c), Fla. R. Civ. P. Once the moving party conclusively establishes that the nonmoving party cannot prevail, it is incumbent on the nonmoving party to submit evidence to rebut the motion for summary judgment. *See Holl v. Talcott*, 191 So. 2d 40, 43 (Fla. 1966). It is not enough for the opposing party merely to assert that an issue of fact does exist. *Fisel v. Wynns*, 667 So.2d 761, 764 (Fla.1996); *Landers v. Milton,* 370 So.2d 368, 370 (Fla.1979) (same).

Moreover, it is well-recognized that the non-moving party faced with a summary judgment motion supported by appropriate proof may not rely on bare, conclusory assertions found in the pleadings to create an issue and thus avoid summary judgment. Instead, the party must produce counter-evidence establishing a genuine issue of material fact. *See Bryant v. Shands Teaching Hospital and Clinics, Inc.,* 479 So.2d 165, 168 (Fla. 1st Dist. Ct. App. 1985); *see also Lanzner v. City of North Miami Beach,* 141 So.2d 626 (Fla. 3d Dist Ct. App. 1962) (recognizing that mere contrary allegations of complaint were not sufficient to preclude summary

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judgment on basis of facts established without dispute). Where the nonmoving party fails to present evidence rebutting the motion for summary judgment and there is no genuine issue of material fact, then entry of judgment is proper as a matter of law. *See Davis v. Hathaway*, 408 So. 2d 688, 689 (Fla. 2d Dist. Ct. App. 1982); *see also Holl*, 191 So. 2d at 43. Faced with these well-established legal principles, Epstein voluntarily dismissed his claims against Edwards on the eve of the hearing on Edwards Motion for Summary Judgment.

B. <u>Epstein's Claim Regarding Edwards Had Absolutely No Factual Basis</u>.

This was not a complicated case for granting summary judgment. To the contrary, the uncontested record clearly established that each and every one of Epstein's claims against Edwards lacked any merit whatsoever.[1]

1. Epstein's allegations regarding Edwards' involvement in Rothstein's "Ponzi Scheme" were unsupported and unsupportable because Edwards was simply not involved in any such scheme.

a. Edwards Had No Involvement in the Ponzi Scheme.

The bulk of Epstein's claims against Edwards hinged on the premise that Edwards was involved in a Ponzi scheme run by Scott Rothstein. Broad allegations of wrongdoing on the part of Edwards were scattered willy-nilly throughout the complaint. None of the allegations provided any substance as to how Edwards actually assisted the Ponzi scheme, and allegations that he "knew or should have known" of its existence are based upon an impermissible pyramiding of inferences. In any event, these allegations all fail for one straightforward reason:

[1] The dismissal of Epstein's claims against Edwards did not affect Epstein's claims against Scott Rothstein. Epstein had already chosen to dismiss all of his claims against L.M., the only other defendant named in the suit.

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The Evening Standard (London)

December 24, 2009 Thursday

LENGTH: 824 words

HEADLINE: CITY SPY

BODY:

EXPECT more media firms to announce plans to charge for content online in early 2010. City Spy hears that business-to-business publisher United Business Media is the latest outfit which is thinking of ramping up its subscription model. Property Week and Building are among the titles which recently started asking users to register their details to keep reading stories, which is seen as a possible precursor to charging.

BUSINESSES TIPPED TO COME A CROPPER

AMID all the contradictory forecasts for recovery or double-dip recession in 2010, what do the insolvency practitioners say? City Spy's mole in the bean-counting world says the last quarter of 2009 was surprisingly quiet as the economy stabilised but they are not optimistic about the new year: "We reckon there's going to be a rush of insolvencies in the second quarter, after the end of the financial year." The next quarterly rent review is due tomorrow, Christmas Day, then again at the end of March. But given the number of "seasonal sales" that started on the High Street at least a week before Christmas, it would be no surprise to see some retailers come a cropper sooner...

EPSTEIN PILOT TAKES TO THE ROAD

FURTHER news reaches City Spy of former Bear Stearns trader, Prince Andrew's shooting companion and convicted sex offender, Jeffrey Epstein.

The ex-Wall Street star served 13 months in jail on criminal charges of soliciting prostitution and procuring a minor for prostitution and he now faces civil claims from young women accusing him of having unlawful sex with them. This week, City Spy recounted how Epstein had transferred the title deeds of his prized 2003 Ferrari 575M Maranello to his private pilot Larry Visoki, prior to the car going on sale for $159,000 (£99,000) (possibly to help Epstein pay his legal bills). It turns out, the same Visoki was deposed last week by Bradley Edwards, an attorney for three of the women suing Epstein. Questioned by Edwards about plane passengers who might have witnessed Epstein in the company of young girls, Visoki admitted Bill Clinton, Prince Andrew, former Israeli prime minister Ehud Barak, former Colombian president Andrés Pastrana Arango, Obama economic adviser Lawrence Summers, billionaire Ron Burkle, and actors Kevin Spacey and Chris Tucker had been on board the plane while young girls were present. Fortuitously for Epstein, however, Ferrari-selling Visoki swore on oath that he never suspected his boss of having sex with them.

Of course not, Larry. Now drive off into the sunset.

More on Prince Andrew, our special representative for international trade and investment. The European Parliament and the Organisation for Security and Co-operation in Europe have strongly condemned Azerbaijan for tightening restrictions on the media and jailing two bloggers who were critical of the government. It transpires the oil-rich country has long blocked BBC broadcasts there, which might explain why oft-criticised Andrew and former Prime Minister Tony Blair spend so much time visiting the sometime Soviet State.

What does the snow have in common with the recession? Every other country can get out of both but Britain can't get out of either. HAPPY news: private jet travel is back, reports the Wall Street Journal. Alas, there is a "but" [#x2039]

in-flight food remains in recession. Apparently, those who supply food to executive aircraft are seeing demand soar after a slump, but says one caterer: "No one is eating lobster. A quick turkey box lunch is the order of the day." Of course, that has nothing to do with the industry being desperate to re-brand itself as time-saving and cost-efficient.

WHICH insurance broker saw a compliance officer pass out after the office Christmas lunch and have to be taken to hospital?

WHO MADE OFF WITH THE MONEY? IT's a year since the Bernie Madoff affair blew up and the hedge fund king was found to have been ripping off his clients. If he was in Britain the old fraudster would still be at liberty as lawyers pored over his case and the prosecution had barely cranked into operation. But the US is different [#x2039] his case is done and dusted, and he's languishing in jail. Even so, by US standards, the Madoff conviction was going some. Rumours persist that he pleaded guilty as quickly as he did and said the absolute minimum because he wasn't the main crook of the piece [#x2039] the main business of his hedge fund was washing money for organised crime. As soon as the balloon went up and he was arrested, he was warned by friends with Italian-American origins that his life, and the lives of his family, would be at risk were he not to "take the rap".

OETaking the rap': hedge fund fraud Bernie Madoff

UNFORTUNATE name? City Spy's eye is drawn to a forthcoming lecture at the Institute of Advanced Legal Studies, School of Advanced Study, University of London. It's in partnership with the Market Abuse Association. What? Do they wear a club tie? Do they refer to each other as fellow market abusers?

LOAD-DATE: December 24, 2009

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orneys Say Miami Prosecutors Violated Crime Victims' Rights Act

tephanie Woodrow | March 22, 2011 11:52 am

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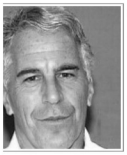
ıse attorneys for two girls who contend they were assaulted by billionaire and cted sex offender **Jeffrey Epstein** filed court papers on Monday claiming the i U.S. Attorney's office violated the Crime Victims' Rights Act by signing a nonprosecution agreement with Epstein ut notifying them, the Palm Beach Daily News reported.



y Epstein (gov)

Epstein served 13 months in jail from June 2008 to July 2009 for one state count of soliciting an underage girl for prostitution. As a result, he is required to register as a sex offender. While he wasn't prosecuted for additional charges, more than 40 girls under the age of 18 say they came to his home and gave him massages. During the massages, they say, he masturbated and sexually assaulted them.

Brad Edwards and **Paul Cassell**, attorneys representing two of his alleged victims, say in the filing that the U.S. Attorney's office for the Southern District of Florida of deliberately misled the victims by telling them there was an ongoing investigation into their claims. However, they say, the office was concealing the fact that they already had signed a 'osecution deal with Epstein.

'ding to the motion, the U.S. Attorney's office in January 2008 and May 2008 sent "false notification" letters in to ·in's alleged victims saying "(t)his case is currently under investigation." However, the office had signed the agreement Epstein in September 2007.

ıttorneys want a court hearing during which they will ask that the agreement be invalidated because it violated the ıs' rights. In the motion, the attorneys claim the agreement is illegal because the government did not protect the ɟressionally mandated rights of victims before it entered this agreement."

dge grants the request, Epstein could be charged by the U.S. Attorney's office. If he were charged and convicted on al charges, he could be sentenced to 10 years to life for each charge.

'ding to the motion, "The only reason that the (U.S. Attorney's office) concealed the existence of the non-prosecution :ment from the victims was not to comply with some legal restriction, but rather to avoid a firestorm of public ɔversy that would have erupted if the sweetheart plea deal with a politically connected billionaire had been revealed."

ı **Valle**, special counsel for the U.S. Attorney's Office Southern District of Florida, in an email to the newspaper that the Attorney's office will respond in court filings.

ever, as we stated more than two years ago in July 2008 in our response to the plaintiffs' then-emergency petition for ɔement of the Crime Victim Rights Act, the CVRA was not violated because no federal charges were ever filed in the ıern District of Florida," Valle said. "Because the matter remains pending in court, it would be inappropriate at this time ɔvide additional comment on the merits of the current motion."

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Attorneys want Jeffrey Epstein agreement thrown out

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By MICHELE DARGAN
DAILY NEWS STAFF WRITER

Updated: 9:41 a.m. Wednesday, March 23, 2011
Posted: 7:21 p.m. Monday, March 21, 2011

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Court papers filed Monday say the U.S. Attorney's Office violated the Crime Victims' Rights Act by signing a nonprosecution agreement with sex offender Jeffrey Epstein without notifying his victims.

Attorneys Brad Edwards and Paul Cassell, representing Jane Doe #1 and Jane Doe #2, want a court hearing, where they will ask that the agreement be invalidated because, they say, the victims' rights were violated. If that happens, it could open up the 58-year-old Palm Beach billionaire to a slew of federal charges involving sex crimes with minors that were set aside by the agreement.

The motion, filed Monday in federal court in West Palm Beach, accuses the U.S. Attorney's Office of deliberately misleading the victims by telling them the investigation was ongoing, while concealing they had already signed a deal with Epstein.

According to the motion, the U.S. Attorney's Office sent "false notification" letters in January 2008 and May 2008 to the victims saying "(t)his case is currently under investigation" after the government had signed the agreement with Epstein in September 2007.

"The only reason that the (U.S. Attorney's Office) concealed the existence of the non-prosecution agreement from the victims was not to comply with some legal restriction, but rather to avoid a firestorm of public controversy that would have erupted if the sweetheart plea deal with a politically connected billionaire had been revealed," the motion says.

If Epstein were found guilty on federal charges, statutory penalties ranged from 10 years to life.

Instead, the sealed pact was part and parcel of Epstein's acceptance of a state plea deal, where he received an 18-month sentence for soliciting a minor for prostitution and soliciting prostitution. He served 13 months segregated in a vacant wing of the county stockade and was let out on work release six days a week for up to 16 hours a day.

Edwards and other attorneys fought in court for a year before successfully getting the agreement unsealed in September 2009. More than 30 minor girls were identified as Epstein's victims in the pact.

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Doe 1 and 2, who were 14 and 13, respectively, at the time of the incidents, received monetary settlements in civil cases. They are among more than two-dozen underage girls who filed lawsuits or settled claims against Epstein, alleging they were lured to his Palm Beach mansion to give him sexually charged massages and/or sex in exchange for money.

The motion filed Monday says the agreement is illegal because the government did not protect the "Congressionally mandated rights of victims before it entered this agreement."

Alicia Valle, special counsel for the U.S. Attorney's Office Southern District of Florida, said in an e-mail that the U.S. Attorney's Office will respond in court filings.

"However, as we stated more than two years ago in July 2008 in our response to the plaintiffs' then-emergency petition for enforcement of the Crime Victim Rights Act, the CVRA was not violated because no federal charges were ever filed in the Southern District of Florida," Valle said. "Because the matter remains pending in court, it would be inappropriate at this time to provide additional comment on the merits of the current motion."

The attorneys reference e-mails and letters from the federal office to Epstein's lawyers acknowledging the government's legal obligation to inform victims about the pact. The e-mails are redacted in the motion because they are under seal. The attorneys filed a separate motion Monday to unseal the correspondence.

"The reasonable inference from the evidence is that the U.S. Attorney's Office wanted to keep the agreement a secret to avoid intense criticism that would surely ensued had the victims and the public learned that a billionaire sex offender with political connections had arranged to avoid federal prosecution for numerous felony sex offenses against minor girls," the motion says. "As part of this pattern of deception, the U.S. Attorney's Office discussed victim notification with the defendant sex offender and, after he raised objections, stopped making notifications."

Epstein sought "a higher level of review" within the Department of Justice, the motion says. "A reasonable inference from the evidence is that Epstein used his significant political and social connections to lobby the Justice Department to avoid significant federal prosecution," the motion states.

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Palm Beach Daily News (FL)

JUDGE RECEIVES EPSTEIN TAPE RULING PENDING

MICHELE DARGAN, Daily News Staff Writer
Published: May 5, 2010

NEW YORK -- A Manhattan federal judge Tuesday took into custody a tape-recorded conversation between veteran newspaper reporter George Rush and convicted sex offender Jeffrey Epstein.

But U.S. District Judge Lawrence M. McKenna reserved ruling on whether the recording will be released to attorneys representing young women who were sexually abused by Epstein as minors. McKenna didn't listen to the recording during the hearing. Fort Lauderdale attorney Brad Edwards and Utah attorney and law professor Paul Cassell are fighting to obtain the 22-minute tape on behalf of Epstein victim Jane Doe. She has filed one of a dozen pending civil cases in federal court in West Palm Beach against Epstein.

A status check is set for Thursday in those cases before U.S. District Judge Kenneth Marra.

Doe could have settled the lawsuit for $50,000 but is asking for $50 million in damages, Cassell said Tuesday. "Jane Doe was repeatedly sexually assaulted over a lengthy period of time by this wealthy and powerful man," Cassell said.

Epstein, 57, is currently under house arrest in his Palm Beach home after serving 13 months of an 18-month state sentence for soliciting a minor for prostitution and soliciting prostitution. Nearly two dozen young women have filed lawsuits against the billionaire money manager -- some already settled -- all alleging Epstein sexually abused them as minors at his El Brillo Way home.

Cites reporter's protected privilege

Rush, of the New York Daily News, was present in the courtroom, but did not have to testify Tuesday. Neither did Fort Lauderdale private investigator Michael Fisten, also in the courtroom. Working on behalf of Epstein victims, Fisten discovered the existence of the tape and had a conversation with Rush about its contents.

Representing Rush and the newspaper, Washington attorney Laura Handman and New York Daily News attorney Anne Carroll argued the tape should not be released under any circumstances, citing reporter's protected privilege. Rush told Epstein the conversation was "off the record" and has never published any portion of that conversation. But even if portions had been printed, the unpublished portions would still be protected, Handman said.

Handman cited cases where interviews were conducted in the presence of other people and privilege was not waived.

In addition, Handman argued that Rush should not have to testify in court.

The ability for reporter's privilege to be protected is crucial in culling sources and gathering information for news stories, Handman said. Reporting is all about give and take between the reporter and the source; that's what reporters have to do, Handman said.

"This is so critical to news gathering," Handman said. "Mr. Rush could find himself testifying in [many] cases just because he had the temerity to do some reporting on a very important story."

There is nothing helpful to Doe's case on the tape and "Jane Doe is not referred to once in that tape," Handman said.

Cassell argued that the tape is "critical in showing Epstein's lack of remorse."

Cassell described Epstein as a pitiless sexual abuser to Jane Doe and at least 30 other minor girls. Even though Jane Doe is not referred to by name on the tape, Epstein refers to his victims as "the girls" and makes disparaging remarks about them on the tape, Cassell said.

Tape played for others

Cassell said privilege does not apply because it was waived when Rush played the tape for three people and verbally divulged its contents to two others, including Fisten and Edwards, who also represents two other victims. But even if there is "qualified privilege," Cassell says, it is outweighed by Doe's inability to obtain the information anywhere else and the jury's need to hear Epstein's own words about his lack of remorse.

Since Epstein has exercised his Fifth Amendment right during questioning by victims' attorneys, the jury

will have no other way to hear Epstein's words in his own voice, Cassell said.
Deadline for discovery in the Doe case is May 31, with the trial set for July 14.
-- mdargan@pbdailynews.com

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Palm Beach Daily News (FL)

LAWYER: EPSTEIN MADE ADMISSIONS ON TAPE

MICHELE DARGAN, Daily News Staff Writer
Published: April 29, 2010

A tape recorded interview between a reporter and convicted sex offender Jeffrey Epstein contains "damning admissions by Epstein," which includes Epstein saying he had come "close to crossing a line" concerning sex with underage girls.

Those and other revelations about the 22-minute interview by New York Daily News reporter George Rush with Epstein are contained in a 24-page court filing by attorneys Brad Edwards and Paul Cassell on behalf of Jane Doe. Edwards represents Doe and two other Epstein victims. Edwards and Cassell are fighting to obtain the tape to further their case of sexual abuse by Epstein when Doe was a minor.

Epstein, 57, was released from jail in July after serving 13 months of an 18-month state sentence for soliciting a minor for prostitution and soliciting prostitution. Nearly two dozen young women have filed lawsuits against Epstein -- some already settled -- all alleging Epstein sexually abused them as minors at his El Brillo Way home, where he is now serving house arrest.

The New York Daily News is seeking to keep the tape confidential, citing reporter's protected privilege.

In response, Cassell says the newspaper waived its protected privilege when Rush played the recording for three people and described its contents to two others, including Edwards.

In addition, Cassell writes that privilege can't be applied in this situation because it doesn't involve an issue related to a confidential source. The person on the tape is Epstein.

Even if there is "qualified privilege," Cassell maintains it is outweighed by Doe's inability to obtain the information anywhere else and her "compelling need to obtain Jeffrey Epstein's own words about his sexual abuse and lack of remorse."

When reached by phone Wednesday, Anne Carroll, attorney for the New York Daily News, said she will answer Cassell in a court filing. Both the New York Daily News and Doe have asked a federal court judge in Manhattan to listen to the tape in chambers to help determine whether privilege applies.

Epstein and others who helped him procure minor girls for massages and sex acts have taken the Fifth Amendment in their depositions, stymieing Doe and the other victims suing Epstein, the documents say.

Michael Fisten, an investigator working for Doe, discovered the existence of the tape in fall 2009. An author who had listened to the tape told Fisten that Rush had a tape recording of Epstein "discussing the sexual abuse of minor girls."

According to a sworn affidavit by Fisten, he called Rush, who confirmed he interviewed Epstein and made a tape. According to Fisten, Rush told him that he compiled negative information from Epstein about his exploits with underage girls and how he eluded the justice system. But Fisten said that Rush told him that his publisher, who knows Epstein, killed it after receiving a call from Epstein.

Fisten said Rush told him, among other things, that the following information was contained on the tape:

That Epstein said he went to jail in Florida for no reason and if the sexual abuse of minors had happened in New York, he would have only received a $200 fine.

That L.M., one of Edwards' clients who sued Epstein for sexual abuse as a minor, came to him as a prostitute and a drug user (meaning she came to him for sex, rather than him pursuing her).

That all the girls suing him are only trying to get a meal ticket.

That the only thing he might have done wrong was to maybe cross the line a little too closely.

In a sworn deposition, Edwards states that Rush disclosed much of the information contained on the tape to him in a conversation.

Edwards said in his statement that the Rush interview is "unique and not otherwise obtainable from other witnesses because it can be used to prove perjury -- a federal crime.

Edwards said Epstein testified in a deposition that he did not recognize the name George Rush from the New York Daily News "despite the fact that he gave a personal interview that we all now know to have been tape recorded."

-- mdargan@pbdailynews.com

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Epstein
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Greater Palm Beaches and Treasure Coast

Palm Beach sex offender's secret plea deal: Possible co-conspirators not charged, presses victims to settle civil suits

By SUSAN SPENCER-WENDEL

Palm Beach Post Staff Writer

Friday, September 18, 2009

WEST PALM BEACH — Billionaire financier sex offender Jeffrey Epstein's secret non-prosecution agreement he struck with federal prosecutors was unsealed Friday, offering the first public look at the deal Epstein's high-powered legal counsel brokered on his behalf.

According the agreement, the Federal Bureau of Investigation and the U.S. Attorney's Office investigated Epstein for various federal crimes, including prostitution, some punishable by a minimum of 10 years up to life in prison

But federal prosecutors backed down and agreed to recall grand jury subpoeanas, if Epstein pleaded guilty to prostitution-related felonies in state court, which he ultimately did. He received an 18-month jail sentence, of which he served 13.

A former federal prosecutor of 15 years, Mark Johnson of Stuart, said the disparity in the potential sentences was unusual.

The United States Attorney's Office also agreed not to charge any of Epstein's possible co-conspirators - Sarah Kellen, Adriana Ross, Lesley Groff and Nadia Marcinkova.

The agreement was negotiated in part by New York heavyweight criminal defense attorney Gerald Lefcourt.

On its first draft in September 2007, it required that Epstein pay an attorney - tapped by the U.S. Attorney's Office and approved by Epstein - to represent some of the victims in civil suits they had filed against Epstein. That attorney is prominent Miami lawyer Bob Josefsberg.

Former prosecutor Johnson said he has never seen a provision like that before.

But an addendum to the agreement signed the following month struck Epstein's duty to pay Josefsberg if he and the victims did not accept a settlement and instead pursued litigation.

The agreement, signed by Assistant U.S. Attorney Maria Villafana, does not expressly state whether any victims were contacted or consulted before the deal was made.

Attorney Brad Edwards of Fort Lauderdale, who represents three of the young women, believes that none of the between 30 and 40 woman identified as victims in the federal investigation were told of the deal. Edwards said his clients were still receiving letters in the mail months afterwards saying the U.S. Attorney's Office assuring them Epstein would be prosecuted.

"Never consulting the victims is probably the most outrageous aspect of it..." Edwards said. "It taught them that someone with money can buy his way out of anything. It's outrageous and embarrassing for United States Attorney's Office and the State Attorneys Office."

Epstein now faces many civil lawsuits filed by the women, who are represented by a variety attorneys. In many, the facts alleged are the same: that Epstein had a predilection for teenage girls, identified poor, vulnerable ones and lured them to his home via other young women. The teens describe ascending a staircase lined with nude photographs of young girls and to the spa room where Epstein would appear in a small towel.

Former Circuit Judge Bill Berger, who represents one of the victims, and The Palm Beach Post sought the unsealing of the agreement. Berger refers to it as a "sweetheart deal."

"Why was it so important for the government to make this deal?" Berger asked rhetorically. "We have not yet had honest explanation by any public official as to why it was made .. and why the victim's were sold down the river."

Former federal prosecutor Ryon McCabe described the agreement as "very unorthodox." Such agreements, he said, are usually reserved for corporations, not individuals.

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"It's very, very rare. I've never seen or heard of the procedure that was set up here." said McCabe, who has no involvement in any Epstein litigation and is now a securities litigation attorney.

"He's essentially avoiding federal prosecution because he can afford to pay that many lawyers to help those victims review their cases… If a person has no money he couldn't be able to strike a deal like this and avoid federal prosecution."

The back-room deal with federal prosecutors all the more interesting in light of the legal heavyweights who have worked for Epstein, including Harvard professor Alan Dershowitz and Kenneth Starr of Clinton impeachment fame. Lefcourt is a past president of the National Association of Criminal Defense Lawyers.

Epstein's local defense attorney, Jack Goldberger, issued a statement Friday saying he had fought the release of the sealed agreement to protect the third parties named there. "Mr. Epstein has fully abided by all of its terms and conditions. He is looking forward to putting this difficult period in his life behind him. He is continuing his long standing history of science philanthropy..."

Epstein ended up avoiding federal charges, and pleaded guilty in state court to felony solicitation of prostitution and procuring a person under the age of 18 for prostitution. In July 2008, he was sentenced to 18 months in jail, and later allowed out up to six days a week on work release.

Epstein left the jail in late July 2009 after serving not quite 13 months of the sentence, having earned gain time for good behavior.

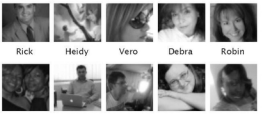
Palm Beach Police began investigating the "international moneyman of mystery," as the New York magazine dubbed him, after they received a complaint from a relative of a 14-year-old girl who had given Epstein a naked massage at his home on the Intracoastal Waterway.

Police sought and found in poor neighborhoods a variety of tall, thin, model-like young women, who told stories of begin recruiting, then going to Epstein's home and massaging and stimulating him. They walked away with between $200 and $1,000.

The investigation triggered tensions between police and prosecutors, with then-Chief Michael Reiter saying in a May 2006 letter to then-State Attorney Barry Krischer that the chief prosecutor should disqualify himself.

"I continue to find your office's treatment of these cases highly unusual," Reiter wrote. He then asked for and got the federal investigation that ended in the sealed deal.

"The Jeffrey Epstein matter was an experience of what a many-million-dollar defense can accomplish," Reiter told the Palm Beach Daily News upon his retirement.



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Local News

Greater Palm Beaches and Treasure Coast

Judge: Palm Beach sex offender Jeffrey Epstein agreement to remain sealed

By MICHELE DARGAN

Palm Beach Daily News Staff Writer

Tuesday, February 17, 2009

A federal judge has ruled that a non-prosecution document under which the government agreed not to pursue federal charges against sex offender Jeffrey Epstein will remain under seal - at least for now.

The U.S. Attorney's Office and Epstein's lawyers reached the agreement before Epstein pleaded guilty to state felony charges, and the document is under seal in Epstein's state criminal file.

Representing two of Epstein's victims, attorney Brad Edwards asked to have the document unsealed as part of his federal lawsuit against the Manhattan money manager. Although Edwards and his victims have seen the agreement, Edwards says in his pleadings that the government has "inaccurately described the agreement ... creating a false impression that the agreement protects the victims."

U.S. District Judge Kenneth Marra ruled that the claims, even if true, haven't damaged Edwards' case.

"If and when such alleged mischaracterizations become relevant to an issue to be decided by the court, the parties will be given the opportunity to advance their positions and the court will resolve the issue," he wrote. "If disclosure of the agreement will be required for the court to resolve this issue, appropriate disclosure will be ordered."

Seeking to keep the agreement sealed, Assistant U.S. Attorney Dexter Lee argued that the agreement is not part of any case before Marra.

"The non-prosecution agreement has never been filed under seal in federal court," he wrote.

He also denied that the agreement has been inaccurately described.

Marra sided with Lee on the argument that the agreement was not filed in federal court "under seal or otherwise."

On Aug. 14, Marra ruled that the non-prosecution agreement would be unsealed for Edwards and any of the victims who want to see it. But the ruling bars Edwards and anyone else who sees the document from disclosing the terms to anyone else.

In his motion to unseal, Edwards said he wants to be able to discuss the terms of the agreement with other victims and their attorneys as well as with other victims' rights groups such as the National Alliance of Victims' Rights Attorneys.

The desire to discuss the agreement with third parties is not justification for unsealing the document, Marra ruled.

"If a specific tangible need arises in a civil case ... relief should be sought in that case," he wrote.

Epstein, 56, is serving 18 months in jail for soliciting prostitution and procuring a minor for prostitution.

Under the agreement, federal prosecutors will defer their decision on whether to prosecute Epstein on federal charges until 90 days after Epstein completes all requirements of his state sentence.

If he abides by all court conditions and restrictions, the federal case would be dropped.

In addition to the state criminal case, there are nine federal and seven state lawsuits pending against Epstein.

All contain similar allegations: The Manhattan money manager, through his employees and assistants, brought minor girls to his Palm Beach home at 358 El Brillo Way for erotic massages and sometimes sex.

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Palm Beach Daily News

June 25, 2009 Thursday
Final Edition

SECTION: A SECTION; Pg. A.1

LENGTH: 557 words

HEADLINE: JUDGE TO RULE ON SEALED PLEA-DEAL PAPERS TODAY

BYLINE: MICHELE DARGAN, MICHELE DARGAN, Daily News Staff Writer

BODY:

A circuit judge will decide today whether the public will be privy to the federal government's non-prosecution deal with Jeffrey Epstein, which was sealed when the convicted sex offender pleaded guilty in June 2008 to two felony counts.

Epstein, of Palm Beach, will be released from the Palm Beach County Stockade July 22, after serving less than 13 months of his 18- month sentence for procuring a minor for prostitution and solicitation of prostitution.

Teri Barbera, spokeswoman for the Palm Beach County Sheriff's Office, confirmed his release date Tuesday.

Epstein's projected release date had been Sept. 24, but gain time -- which includes his participation in a work-release program -- moves the date up to July 22, Barbera said.

Epstein, 56, has been in the work-release program since Oct. 10, in which he is allowed out of the stockade six days a week, from 10 a.m. to 10 p.m., to go to his West Palm Beach office, the Florida Science Foundation, monitored by an ankle bracelet and accompanied by a deputy.

As part of Epstein's state plea agreement, the U.S. Attorney's Office agreed not to prosecute Epstein on federal charges as long as he fulfills all requirements of his sentence and probation. The federal non-prosecution agreement has been under seal in state court.

Epstein's attorney Jack Goldberger filed court papers asking that the documents stay sealed for the following reasons: "to prevent a serious imminent threat to the fair, impartial and orderly administration of justice; to protect a compelling government interest; to avoid substantial injury to innocent third parties and to avoid substantial injury to a party by disclosure of matters protected by a common law and privacy right, not generally inherent in these specific type of proceedings, sought to be closed."

Fort Lauderdale-based attorney Brad Edwards represents three Epstein victims and has asked Circuit Judge Jeffrey Colbath to unseal the federal agreement to the public. An attorney for The Palm Beach Post also has asked that the records be unsealed.

Edwards and his clients have seen the agreement after a federal judge ruled that they are allowed to see it. But that ruling bars Edwards and anyone else who sees the document from disclosing the terms to anyone else.

Edwards said he wants to use that document "in the deposition of various material witnesses" relative to his cases.

Radaronline.com has reported that Epstein has "secretly been helping the feds unravel a Ponzi scheme" related to the June 2008 indictment of two former managers of Bear Stearns Mortgage Investment Fund.

Epstein's rep, Howard Rubenstein, confirmed last year that Epstein is "Major Investor No. 1" in the indictment, which says he lost about $57 million.

Goldberger could not be reached for comment.

The Manhattan money manager has been incarcerated since June 30, when he pleaded guilty to the two felony counts. As part of the plea agreement, Epstein must serve one year of house arrest after his release and register as a life-long sex offender.

In addition to the criminal case, there are more than a dozen civil lawsuits -- both state and federal -- pending against Epstein. All contain similar allegations: Epstein, through his employees and assistants, brought minor girls to his Palm Beach home on El Brillo Way for erotic massages and sometimes sex.

-- mdargan@pbdailynews.com

GRAPHIC: Caption: Epstein To be released from jail July 22.

LOAD-DATE: September 1, 2010

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Heiress quizzed in sex suits

Last Updated: 3:35 AM, October 12, 2009
Posted: 12:55 AM, October 12, 2009
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Ghislaine Maxwell, the British brunette whose father once owned the Daily News, has been slapped with a subpoena in suits brought by 24 underage girls against her old friend, billionaire **Jeffrey Epstein**.

Maxwell -- whose press-lord father, Robert Maxwell, died in 1991 after falling into the Atlantic off his yacht, the Lady Ghislaine -- was served with a subpoena on Sept. 22 at 6:45 p.m. as she was leaving the Clinton Global Initiatives Conference at the Sheraton Hotel.

Florida lawyer **Brad Edwards**, who represents three of the "Jane Does" who are suing Epstein, told Page Six that Maxwell would be questioned over her knowledge of how Epstein procured many of the girls.

Epstein is accused in the civil complaints of luring underage girls to his mansion in Palm Beach to give him massages, during which he allegedly engaged them in sexual activity and paid them hundreds of dollars each. A grand jury indicted Epstein on a charge of felony solicitation of prostitution. Epstein, who pleaded guilty and did 12 months in prison, was deposed last week in the offices of his lawyer, **Jack Goldberger**.

Goldberger wouldn't comment, but a friend of Epstein said, "These [people bringing the complaint] are the lowest of the lows in terms of ambulance-chasing lawyers." The trials are scheduled to start in February.

Nadia Marcinkova, who has been described as Epstein's lesbian sex slave and who visited him behind bars 67 times, has also been served with a subpoena.

Epstein's brother, **Mark Epstein**, who has a real-estate holding company in New York, has already been deposed about a building he owns, 301 E. 66th St. "Jeffrey rents several apartments there where he keeps his girls, alleged models for the MC2 agency he owns," Edwards said. "But Mark acts like he doesn't even know his brother. He was extremely angry and rude and cursed me out."

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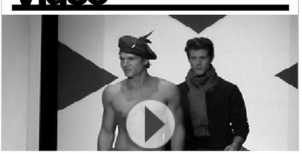

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10/12/2009 8:59 PM
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June 15, 2009 Monday
Palm Beach Edition

SECTION: LOCAL; Pg. 3B

LENGTH: 348 words

HEADLINE: HEARING SET TO CONSIDER SECRECY OF PLEA BARGAIN

BYLINE: Susan Spencer-Wendell The Palm Beach Post

BODY:

A Palm Beach Circuit Court judge will not immediately unseal a deal that wealthy Palm Beach money manager Jeffrey Epstein made with federal prosecutors to avoid charges.

Circuit Judge Jeff Colbath acknowledged, though, at a hearing last week that Epstein's deal was not sealed in accordance with state and local court rules.

"I don't see where any of the procedures were ever followed to begin with," Colbath said.

Colbath also set a full hearing on the matter for June 25.

Attorneys for young women now suing Epstein, together with The Palm Beach Post, are asking Colbath to unseal the deal that Epstein made with federal prosecutors.

"It's a secret agreement, a secret sweetheart agreement," said former Circuit Judge Bill Berger, who represents some of the women. "Everybody was in on this deal except the victims and the public. The public should be outraged it has gone as far as it has."

Brad Edwards, a second attorney representing the women, has seen the sealed deal after a federal judge allowed him and his clients to view it, but would not discuss its contents.

Edwards would say only that the women were "outraged" that it had been negotiated behind their backs.

A reporter asked Edwards whether he thought Epstein received special treatment by federal prosecutors.

"Are you kidding? It's transparent. Certainly, no one else gets treated like that," Edwards said.

Epstein, 56, a reported money manager of billionaires, is serving an 18-month sentence in the Palm Beach County Stockade after pleading guilty almost a year ago in state court to felony solicitation of prostitution and procuring teenagers for prostitution. Epstein is allowed out, though, each day from 7 a.m. to 11 p.m., a Sheriff's Office spokesman said.

Displeased with the way the State Attorney's Office handled the case, Palm Beach police forwarded information to the FBI.

INFORMATIONAL BOX:

Young women have sued

Money manager Jeffrey Epstein made a deal and is serving an 18-month sentence in jail. Attorneys for young women suing Epstein are asking a judge to unseal the deal that Epstein made with federal prosecutors.

NOTES: < Informational box at end of text. {TOPIC} Prostitution solicitation case

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June 11, 2009 Thursday
Final Edition

SECTION: A SECTION; Pg. A.1

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HEADLINE: EPSTEIN PLEA DEAL TO REMAIN SEALED FOR NOW

BYLINE: DAVID ROGERS, DAVID ROGERS, Daily News Staff Writer

BODY:

The plea deal that part-time Palm Beacher Jeffrey Epstein agreed to several months ago to avoid federal charges will remain sealed for the time being.

Lawyers for The Palm Beach Post and a woman who claimed Epstein solicited and procured her for sex at his El Brillo Way home while she was underage asked Palm Beach County Circuit Judge Jeffrey Colbath Wednesday morning to unseal the plea documents immediately.

Instead, Colbath decided to leave the documents sealed and give Jack Goldberger, the attorney representing Epstein, until 1 p.m. Friday to file papers showing why the records should remain out of public view.

Colbath agreed to let the Post and "E.W." have standing in the case and set a hearing on whether the documents should be unsealed for 1:30 p.m. June 25.

Epstein agreed in September 2007 to plead to state charges to avoid federal prosecution, Goldberger told County Judge Deborah Pucillo at Epstein's plea conference last year.

The sealing of the records in question was said to be a "significant inducement" for Epstein, who is serving 18 months in the Palm Beach County Stockade -- with daytime release -- and is facing several civil lawsuits in state and federal courts by more than a dozen alleged victims.

Colbath said, "I don't see where any of the proper procedures to seal the documents were ever followed ..." but that he would give Epstein's legal team the ability to "jump through the hoops to seal the documents if they are entitled in fact to be sealed."

The sealing of court documents in Florida is unusual and lawyers typically have to prove a significant reason for it, such as protecting trade secrets or a compelling government interest.

Goldberger said after the hearing there is no rush to unseal the plea deal.

"I think the records clearly need to be sealed and continue to be sealed but I think the ruling by Judge Colbath was a very well- reasoned practical decision," Goldberger said. "He is not getting special treatment."

Brad Edwards, of the law firm of Rothstein Rosenfeldt Adler of Fort Lauderdale, said the plea deal should be a public record. His firm represents the woman, now 20, who was identified only as E.W.

Whether procedure was followed is not the issue, he said.

"Certainly it should be unsealed regardless. I mean this is a very unusual circumstance where a document like this would be sealed," Edwards said. "None of the other criminal defendants in there (Judge Colbath's courtroom) had their plea bargains, plea agreements, their non-prosecution agreements, sealed."

Edwards said his firm represents three women who claim they were procured for sex with Epstein when they were underage. The three are outraged that the document is under wraps, Edwards said.

Deanna Shullman, the attorney representing the Post, said the public and the press have a constitutional right of access to public records in Florida.

"Fortunately, the status quo is openness. So I think the judge has the idea that the initial closure was done without any adherence to those procedures but was inclined to give Mr. Epstein's lawyers additional time to prove that they should be sealed in accordance with these procedures," Shullman said.

"It's a little disappointing in that we would have liked to see the judge unseal the record because that's what should be the status quo in a situation like this," Shullman said.

-- drogers

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The Evening Standard (London)

December 24, 2009 Thursday

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HEADLINE: CITY SPY

BODY:

EXPECT more media firms to announce plans to charge for content online in early 2010. City Spy hears that business-to-business publisher United Business Media is the latest outfit which is thinking of ramping up its subscription model. Property Week and Building are among the titles which recently started asking users to register their details to keep reading stories, which is seen as a possible precursor to charging.

BUSINESSES TIPPED TO COME A CROPPER

AMID all the contradictory forecasts for recovery or double-dip recession in 2010, what do the insolvency practitioners say? City Spy's mole in the bean-counting world says the last quarter of 2009 was surprisingly quiet as the economy stabilised but they are not optimistic about the new year: "We reckon there's going to be a rush of insolvencies in the second quarter, after the end of the financial year." The next quarterly rent review is due tomorrow, Christmas Day, then again at the end of March. But given the number of "seasonal sales" that started on the High Street at least a week before Christmas, it would be no surprise to see some retailers come a cropper sooner...

EPSTEIN PILOT TAKES TO THE ROAD

FURTHER news reaches City Spy of former Bear Stearns trader, Prince Andrew's shooting companion and convicted sex offender, Jeffrey Epstein.

The ex-Wall Street star served 13 months in jail on criminal charges of soliciting prostitution and procuring a minor for prostitution and he now faces civil claims from young women accusing him of having unlawful sex with them. This week, City Spy recounted how Epstein had transferred the title deeds of his prized 2003 Ferrari 575M Maranello to his private pilot Larry Visoki, prior to the car going on sale for $159,000 (£99,000) (possibly to help Epstein pay his legal bills). It turns out, the same Visoki was deposed last week by Bradley Edwards, an attorney for three of the women suing Epstein. Questioned by Edwards about plane passengers who might have witnessed Epstein in the company of young girls, Visoki admitted Bill Clinton, Prince Andrew, former Israeli prime minister Ehud Barak, former Colombian president Andrés Pastrana Arango, Obama economic adviser Lawrence Summers, billionaire Ron Burkle, and actors Kevin Spacey and Chris Tucker had been on board the plane while young girls were present. Fortuitously for Epstein, however, Ferrari-selling Visoki swore on oath that he never suspected his boss of having sex with them.

Of course not, Larry. Now drive off into the sunset.

More on Prince Andrew, our special representative for international trade and investment. The European Parliament and the Organisation for Security and Co-operation in Europe have strongly condemned Azerbaijan for tightening restrictions on the media and jailing two bloggers who were critical of the government. It transpires the oil-rich country has long blocked BBC broadcasts there, which might explain why oft-criticised Andrew and former Prime Minister Tony Blair spend so much time visiting the sometime Soviet State.

What does the snow have in common with the recession? Every other country can get out of both but Britain can't get out of either. HAPPY news: private jet travel is back, reports the Wall Street Journal. Alas, there is a "but" [#x2039]

in-flight food remains in recession. Apparently, those who supply food to executive aircraft are seeing demand soar after a slump, but says one caterer: "No one is eating lobster. A quick turkey box lunch is the order of the day." Of course, that has nothing to do with the industry being desperate to re-brand itself as time-saving and cost-efficient.

WHICH insurance broker saw a compliance officer pass out after the office Christmas lunch and have to be taken to hospital?

WHO MADE OFF WITH THE MONEY? IT's a year since the Bernie Madoff affair blew up and the hedge fund king was found to have been ripping off his clients. If he was in Britain the old fraudster would still be at liberty as lawyers pored over his case and the prosecution had barely cranked into operation. But the US is different [#x2039] his case is done and dusted, and he's languishing in jail. Even so, by US standards, the Madoff conviction was going some. Rumours persist that he pleaded guilty as quickly as he did and said the absolute minimum because he wasn't the main crook of the piece [#x2039] the main business of his hedge fund was washing money for organised crime. As soon as the balloon went up and he was arrested, he was warned by friends with Italian-American origins that his life, and the lives of his family, would be at risk were he not to "take the rap".

OETaking the rap': hedge fund fraud Bernie Madoff

UNFORTUNATE name? City Spy's eye is drawn to a forthcoming lecture at the Institute of Advanced Legal Studies, School of Advanced Study, University of London. It's in partnership with the Market Abuse Association. What? Do they wear a club tie? Do they refer to each other as fellow market abusers?

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Palm Beach Daily News

September 20, 2009 Sunday
Dn1 Edition

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HEADLINE: ATTORNEY FOR EPSTEIN VICTIMS: 'I HAVE NEVER SEEN A STRANGER CASE'

BYLINE: MICHELE DARGAN, MICHELE DARGAN, Daily News Staff Writer

BODY:

Sex offender Jeffrey Epstein could have been charged with multiple counts of five federal offenses involving sex acts with minors and faced a life sentence, but, instead, the government agreed not to prosecute him or his procurers if he spent 18 months in the county jail on two state charges.

Those were the details unsealed Friday in a nine-page federal non- prosecution agreement that lets Epstein and co-conspirators Sarah Kellen, Adriana Ross, Lesley Groff and Nadia Marcinkova off the hook for any of those past crimes.

"He could have gone to prison for life and somehow he's getting immunity in exchange for nothing?" said Fort Lauderdale attorney Brad Edwards, who represents three Epstein victims. "I have never seen a stranger case. To me, it's more spectacular what's not in it. It's the U.S. Attorney's Office saying we'll do everything in our power to see he doesn't get punished."

Edwards has been fighting for a year in federal and state court to unseal the agreement.

"The non-prosecution agreement raises more questions than it answers," said Miami attorney Adam Horowitz, who represents seven victims. "Why did all the co-conspirators receive immunity? Why were the victims not consulted regarding the sentence? Why did he receive such a minimal sentence?

The federal deal has remained sealed in Epstein's state court file since he pleaded guilty in June 2008 to state charges of procuring a minor for prostitution and soliciting prostitution.

U.S. Attorney's Office does not comment

The federal charges he could have faced were: conspiracy to persuade minor females to engage in prostitution, conspiracy to travel to engage in illicit sexual conduct with minor females, persuading minor females to engage in prostitution, traveling to engage in illicit sexual conduct with minor females and causing a person under 18 years to engage in sex for money while knowing they are underage.

The charges carry various statutory penalities ranging from 10 years to life, with a minimum mandatory of at least 10 years.

Alicia Valle, spokeswoman for the U.S. Attorney's Office in Miami, declined comment.

Expert: Feds take few sex-assault cases

North Palm Beach criminal defense attorney Barry Maxwell said he is not surprised that federal charges weren't filed.

"My experience has been that the federal government does not intervene in sex-assault cases, except if we're dealing with a serial rapist or it crosses jurisdictional lines," Maxwell said. "It's either not a big enough case or not atrocious enough for them."

Epstein, 56, served 13 months of his 18-month sentence at the Palm Beach County Stockade and received liberal work-release privileges while in jail. He was able to go to his West Palm Beach office six days a week for up to 16 hours a day.

He is now serving one year of probation at his Palm Beach mansion and is registered as a lifelong sex offender.

Epstein 'fully abided' by deal, says defense

Epstein's attorney Jack Goldberger released the following statement: "This document relates to allegations that were made many years ago. It was by its provisions and agreement of the parties to remain confidential in part to protect the identities of collateral third parties.

"Mr. Epstein has fully abided by all of its terms and conditions. He is looking forward to putting this difficult period of his life behind him. He is continuing his longstanding history of science philanthropy both here in South Florida and nationwide."

Goldberger had blocked the unsealing by filing court papers asking that the documents stay sealed "to prevent a serious imminent threat to the fair, impartial and orderly administration of justice; to protect a compelling government interest; to avoid substantial injury to innocent third parties; and to avoid substantial injury to a party by disclosure of matters protected by a common law and privacy right, not generally inherent in these specific type of proceedings, sought to be closed."

Circuit Judge Jeffrey Colbath ordered the agreement to be unsealed in June, but Epstein's attorneys appealed the ruling to the Fourth District Court of Appeals, which affirmed Colbath's ruling. Colbath had ruled that the federal agreement -- sealed in state court -- was improperly sealed.

'I felt it was my fault'

More than a dozen lawsuits against the billionaire money manager have been filed in federal and state court, all with similar allegations: that a minor girl was taken to Epstein's mansion on El Brillo Way and led upstairs to a spa room by one of Epstein's assistants, where he would ask the girl to perform massages and/or various sex acts, for which he would pay her.

One victim, who is known as Jane Doe #5 in a federal court lawsuit against Epstein, said she didn't find out about the deal until after it was finalized. She was 15 at the time one of her schoolmates told her she could make $200 by giving a massage to a man in Palm Beach.

She says she was "nervous and scared and wanted to leave" once she got to Epstein's spa room.

"I thought, 'I can't call my dad or my mom because I'm stuck in this situation and didn't know what to do," she said. "I really didn't know what this man was capable of. For a long time, I felt like it was my fault and that's exactly what he wanted me to feel."

Epstein has curfew

While he is serving the 12 months of house arrest at his Palm Beach home, Epstein must observe a 10 p.m. to 6 a.m. curfew, have no unsupervised contact with anyone younger than 18 and not view, own or possess pornographic or sexual materials.

The indictment followed an 11-month investigation by Palm Beach police, who said Epstein paid five underage girls for massages and sometimes sex at his El Brillo Way home. Then-State Attorney Barry Krischer declined to prosecute Epstein on multiple charges involving unlawful sex acts with minors. Instead, he brought the case to a grand jury, which charged Epstein on the lesser charge of soliciting prostitution.

Then-Palm Beach Police Chief Michael Reiter wrote Krischer a letter asking him to recuse himself from the case. When that didn't happen, Reiter requested an FBI investigation to determine if any federal laws were broken.

'Out of the ordinary'

West Palm Beach criminal defense attorney Gregg Lerman said several aspects of the Epstein case are unusual.

"I don't understand why it would be a federal case in this circumstance, and why was there anything in writing at all and why did they seal the agreement?" Lerman said. "Why did it go to the grand jury instead of through the state filing lewd assault charges? That's unusual. And it's very unusual that they structure a plea to get county time rather than prison time. That's definitely out of the ordinary. Nobody goes to county jail as a state criminal punishment."

-- mdargan

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GRAPHIC: Caption: Epstein Deal does not allow prosecution of co- conspirators.

LOAD-DATE: September 1, 2010

Jeffrey Epstein address book 'Holy Grail' of famous names

By **MICHELE DARGAN**
DAILY NEWS STAFF WRITER

Updated: 7:58 p.m. Friday, March 11, 2011
Posted: 7:57 p.m. Friday, March 11, 2011

When talking about the personal address book of billionaire sex offender Jeffrey Epstein, the term "little black book" takes that phrase to a whole new level.

Manhattan money manager Epstein's book reads like a laundry list of the world's richest and most powerful people, including some Palm Beachers.

Referred to as "The Holy Grail" by Epstein's former house manager — now serving time for trying to sell it to attorneys — the 97-page address book details multiple addresses, phone numbers, e-mails and other contact information for former President Bill Clinton, Britain's Prince Andrew and Sarah Ferguson, Donald Trump, Sen. John Kerry, various members of the Kennedy clan and former British Prime Minister Tony Blair, among many others.

The British press has been having a field day digging up new details about Epstein's friendship with Prince Andrew. Virginia Roberts — known only as Jane Doe 102 in court papers — has been dishing her story to London's Daily Mail. Details include Roberts having been in the company of the prince three times at Epstein's behest.

Roberts also recounted meeting Clinton on Epstein's private Caribbean island, according to the Mail.

But Roberts made no suggestion of sexual relations with Prince Andrew or with Clinton, the Mail reported. Similarly, there is no suggestion of anything salacious with any of the Palm Beachers listed among the money manager's contacts.

Roberts — who spent four years with Epstein — refers to him as "a monster" who paid her lavishly to satisfy his and his friends sexual whims — although Roberts doesn't identify the friends.

British papers also have reported that Ferguson accepted £15,000 from Epstein. The money was paid to her former assistant, who claimed Ferguson owed him unpaid wages and other bills. Ferguson has since told the Mail and other British papers that she made "a gigantic error of judgment" in accepting the money from Epstein and that she will pay him back.

The entire "Grail" was made public as part of a pending civil court case in which Epstein is suing attorney Brad Edwards, who represented several underage girls who sued Epstein.

Epstein sued Edwards, alleging he was involved in false claims made by Ponzi schemer Scott Rothstein; Edwards countersued Epstein, saying he filed a frivolous lawsuit to get him to back down from representing the young women.

All the lawsuits against Epstein said his modus operandi in the initial visit was the same: The girls were taken to Epstein's Palm Beach mansion and led upstairs to a spa room by one of Epstein's assistants, where he would ask the girls to perform sexually charged massages and/or various sex acts, for which he would pay them.

Other high-profile names in Epstein's book include Special Envoy for Middle East Peace George Mitchell, New York City Mayor Michael Bloomberg, New York Gov. Andrew Cuomo, Barbara Walters, Alec Baldwin, Ralph Fiennes, George Hamilton, Dustin Hoffman, Kevin Spacey, Liz Hurley, Lauren Hutton, Janice Dickinson, Naomi Campbell, Christy Turlington, Henry Kissinger, Joan Rivers, Courtney Love, Mick Jagger, Cornelia Guest, Phil Collins, Itzhak Perlman, Simon LeBon, Charlie Rose, Richard Branson, playwright Candace Bushnell, designers Tom Ford and Vera Wang, soap opera actress Nadia Bjorlin and erotic film star Koo Stark, who once dated Prince Andrew.

Among the high-powered Palm Beachers listed in the money manager's address book are Catherine and Fred Adler, Samantha and Serena Boardman, Jimmy and Jane Buffett, Pepe Fanjul, Conrad and Barbara Black, Gerry Goldsmith, Marjorie Gubelman, Dana Hammond, David Koch, Henry Kravis, Frayda and George Lindemann Sr., Bob and Todd Meister, Alfred Taubman, Stanley, Bea and Brett Tollman, and Martin Trust.

Gaston Cantens, a spokesman for Florida Crystals Corp., said Fanjul and Epstein "obviously knew each other and had some contact in the past. But there isn't any ongoing business or social relationship with Mr. Epstein."

Reached by phone at his Palm Beach home, media mogul Black said he knew Epstein as “a friend of my colleague Mr. Wexner.”

Les Wexner, CEO of The Limited Brands, was reported to have been Epstein’s biggest client and close friend. Wexner replaced Epstein as his money manager, according to recent reports.

Some of the names in Epstein’s book are sub-listed under geographic locations. The heading “massage” is notated under many of Epstein’s locations. Names and phone numbers, most of them first names only, are listed under the massage entries.

Registered as a level 3 sex offender, Epstein pleaded guilty to soliciting underage girls for sex at his El Brillo Way home in Palm Beach. In addition to serving 13 months of an 18-month jail sentence, Epstein has settled at least two dozen lawsuits with young women for undisclosed amounts.

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http://www.palmbeachdailynews.com/news/jeffrey-epstein-address-book-holy-grail-of-famous-1315130.html

The Telegraph

Jeffrey Epstein 'kept a diary of his under-aged victims'

The Duke of York's billionaire paedophile friend kept a secret journal, described as "The Holy Grail" by lawyers, which listed his alleged under-aged victims and the celebrity guests he entertained at his Florida mansion.

Jeffrey Epstein and Ghislaine Maxwell at Sandringham in 2000 Photo: ALBANPIX

By Jon Swaine (http://www.telegraph.co.uk/journalists/jon-swaine/) , New York

8:00AM GMT 05 Mar 2011

8,591 followers

Jeffrey Epstein used the "black book" to log contact details of the girls that gave massages to him and his friends and those of his powerful and famous associates, such as Bill Clinton and Donald Trump.

A servant at the £4 million manor in Palm Beach, where Prince Andrew enjoyed daily massages during several stays, stole the journal and initially kept it secret from investigators. He is now in prison after attempting to sell it for $50,000 (£31,000).

Epstein, 58, was accused of sex offences by more than 20 under-aged girls. They alleged that after being recruited as masseuses by aides including Ghislaine Maxwell, daughter of the late tycoon Robert, they were seriously assaulted and then paid hundreds of dollars.

The billionaire financier, who attended The Queen's birthday party in 2000, was sentenced to 18 months in prison in 2008, having secured a plea bargain that prevented full criminal trials. He later settled more than a dozen multi-million dollar civil lawsuits from his alleged victims out of court.

The previously undisclosed journal, however, "detailed the full scope and the extent of Epstein's involvement with underage girls", according to lawyers for several alleged victims.

Prosecutor of the Duke of York's sex offender friend Jeffrey Epstein speaks of 'assault' (http://www.telegraph.co.uk/news/uknews/theroyalfamily/8407689/Prosecutor-of-the-Duke-of-Yorks-sex-offender-friend-Jeffrey-Epstein-speaks-of-assault.html)

Duke of York pleads with government over links to dictator (http://www.telegraph.co.uk/news/uknews/theroyalfamily/8363180/Duke-of-York-pleads-for-government-support-over-dinner-with-Tunisian-dictators-relation.html)

It contained the names of girls that Epstein allegedly abused in "Michigan, California, West Palm Beach, New York, New Mexico, and Paris", according to court papers.

It also listed extensive contact details for Epstein's house guests, who had "no connection whatsoever" with alleged offences, including Mr Clinton, the former US President, and Mr Trump, the famous businessman.

It could not be confirmed last night whether the book contained contact details for the Duke. One lawyer for Epstein's alleged victims said: "I would bet he is, because he is that good a friend".

There is no suggestion that the Duke did anything wrong. However he has this week faced a string of questions about his judgment due to his association with a convicted child sex offender.

Epstein kept 21 different phone numbers for Mr Clinton, including some for his assistant and also "Clinton's personal numbers", the court papers state.

Alfredo Rodriguez, a servant who "saw numerous underage girls coming into Epstein's mansion for purported 'massages'," took the journal and did not mention it to investigators.

"Because of the importance of the information in the journal to the civil cases, Mr Rodriguez called it 'The Holy Grail'," the court documents state.

He attempted to sell the book to lawyers for $50,000 (£31,000) in August 2009 - by which time Epstein had already been sentenced and released from jail.

The lawyers contacted the FBI, who sent an undercover agent to buy the book from Rodriguez. He was then arrested and charged with obstruction of justice.

Rodriguez, who said in sworn testimony that he was terrified of Miss Maxwell, also said he took the book as an “insurance policy” to prevent Epstein making him “disappear”.

He was sentenced to 18 months in prison – the same punishment Epstein received for his sex offences – in June last year. His wife, Patricia Dunn, told The Daily Telegraph that he was “sorry” for his error.

Dave Lee Brannon, an Assistant Public Defender who represented Rodriguez, said: “If this book had been produced when requested, Mr Epstein’s sentence may have been significantly different.”

Details of the journal emerged in a lawsuit brought in Florida by Epstein against Brad Edwards, a lawyer representing several alleged victims.

Epstein alleges Edwards was linked to a "Ponzi scheme" run by a colleague, which lured investors by falsely claiming Epstein had agreed to settle sex-offence lawsuits for hundreds of millions of dollars.

Edwards rejects the allegation, which has already been dismissed by the Florida Bar.

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Judge denies gag order in Epstein, Edwards lawsuit; dismisses complaint

By **MICHELE DARGAN**
DAILY NEWS STAFF WRITER

Updated: 7:25 p.m. Wednesday, July 13, 2011
Posted: 7:11 p.m. Wednesday, July 13, 2011

A circuit judge Wednesday squashed an attempt by attorneys for Jeffrey Epstein to prevent parties in a civil lawsuit involving the billionaire sex offender from talking to the media.

Circuit Judge David Crow denied the motion for a gag order.

In addition, Crow dismissed the complaint by Epstein against attorney Brad Edwards, who has represented 10 underage girls in sex abuse claims brought against Epstein. Epstein alleged Edwards abused the court system by threatening to depose Epstein's powerful friends, which included Donald Trump and President Bill Clinton.

Other claims included that Edwards tried to obtain records from an alleged sex therapist who had never treated Epstein and that Edwards used investigative tools that included trespassing on Epstein's property.

Crow gave Epstein's attorneys 30 days to refile the lawsuit, which will be the second amended complaint and third evolution of the lawsuit.

Epstein also named Edwards' former boss, convicted Ponzi schemer Scott Rothstein, in the lawsuit, alleging Rothstein made "various representations to potential investors regarding the Epstein actions."

In dismissing the lawsuit, Crow said he found "serious problems" with the complaint. Crow called the lawsuit "vague.

"You have to know, at this point in time, what he did or didn't do that was an abuse of process," Crow said.

Epstein, 58, has confidentially settled more than two dozen lawsuits with young women who allege they were sexually abused by him when they were minors.

Edwards filed a counterclaim, alleging Epstein filed the lawsuit to get Edwards to back down from representing the victims.

"Mr. Epstein had to pay more to settle these cases than he would have if Mr. Edwards wasn't out there putting all this pressure on him," said attorney Jack Scarola, who represents Edwards. "That's Mr. Edwards' job ... to put as much legitimate pressure on the defendant as he possibly could and he obviously did an extremely effective job."

Epstein pleaded guilty to two felony charges: soliciting prostitution and soliciting a minor for prostitution. He served 13 months in the county jail and has to register as a lifelong sex offender.

Representing Epstein, attorney Joseph Ackerman argued unsuccessfully for a gag order. Ackerman said Scarola has repeatedly made statements to several news organizations about the case.

"Mr. Scarola has constantly referred to Mr. Epstein as a pedophile and there's been no proof of that anywhere," Ackerman said. "Muzzling lawyers who may wish to make public statements has been long recognized as within the court's inherent power ... We don't believe it's appropriate to wage a media campaign and taint the jury pool."

Scarola said it would be unconstitutional to impose a gag order.

"There is a complete and total absence of proof that we have engaged in any conduct whatsoever that could be prohibited," Scarola said.

Scarola said he and Edwards have been asked to appear on national television as well as received interview requests from the foreign press. Scarola said he has been selective in his interviews.

There has been a frenzy in the British press ever since Virginia Roberts, an Epstein victim, spoke to the Sunday Daily Mail earlier this year about being introduced to Prince Andrew and spending time with him at Epstein's behest. Roberts alleged she served as a sex slave to Epstein when she was a minor.

“If Mr. Epstein is embarrassed by Mr. Epstein’s conduct, that’s Mr. Epstein’s problem,” Scarola said.

“I’m pleased to hear he’s embarrassed by his conduct. Maybe it will serve as some deterrent in the future.”

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http://www.palmbeachdailynews.com/news/judge-denies-gag-order-in-epstein-edwards-lawsuit-1606397.html

Navigating our presidential campaign was a piece of cake compared to understanding the nuances of the 2011 Oscar race for the most revered artistic honor in the world.

This is how nine films fell into the big picture.

Three premiered in Cannes mid-May, a distant nine months ago, creating an Oscar campaign as long as any human pregnancy.

At the Palais, the first inkling of Oscar buzz was born as reclusive Woody Allen premiered "Midnight in Paris".

PBS later aired a documentary of Woody discussing his forty-four films showing the astonishing depth of his talent that made you want to immediately hand him the Oscar for Best Picture. Academy rules and Woody forbade marketing this gem.

Woody is not a member of the Academy because he doesn't feel that films should be in competition. He told me, "A statue does not change your life. You still get a cold. You can't get a date. You still have everyday things to worry about". The Academy learned to love him from a distance and gave him best original screenplay as a consolation.

Terrence Malick's long awaited esoteric "The Tree of Life" unveiled at Cannes and won the coveted " Palme D'Or " positioning it for a nomination.

"The Artist", created by the French, shot in Hollywood and about Hollywood was the festival surprise. This charming and oddly original black and white silent entry was introduced by the ringmaster himself, Harvey Weinstein. No one could pronounce or spell director Michel Hazanavicius's name. Jean Dujardin could not speak a word of English and neither could his 10 year old co-star, the Jack Russell Uggie who had been rescued from the pound after two adopters found him too wild. Tragically Uggie developed an undisclosed neurological disorder during production, forcing him to retire at the height of his popularity.

No slam dunk Oscar winner emerged in Cannes. Any future film could easily win.

DreamWorks' "The Help" premiered in LA in August and distributer Disney began propelling the politically correct and socially significant film to box office heaven of $200 million. Viola Davis and Octavia Spencer were forecast to win Oscars.

In September, the Toronto and New York Film Festivals and Fox Searchlight presented Alexander s's Hawaiian family saga, "The Descendants," which broke out of the pack with whispers of winning. Beloved George Clooney, playing a father for the first time was hailed a shoe-in for best actor. Directing "Ides of March" was additional momentum.

Also at New York's festival Marty Scorsese and Paramount sneaked an unfinished cut of "Hugo" in Alice Tully Hall, built for concerts but converted into a 3-D theater. Marty was christened the visionary genius of an innovative costly 3-D masterpiece.

Director Bennett Miller's highly anticipated "Moneyball" for Sony hit a grand slam at its west coast premiere in Oakland aligning the film, it's heart throb star Brad Pitt, Jonah Hill and seasoned writers Steve Zaillian and Aaron Sorkin in play.

Spielberg's epic "War Horse" for DreamWorks came thundering down the pike with a huge premiere back at Alice Tully Hall with posters of Lincoln Center's Tony winning theatrical "War Horse" with their indelible puppets in the background. Steven paid homage to legends John Ford and David Lean and the country fell in love with a horse named Joey and his fourteen stand-ins.

Studios worked their stars to the bone. Ironically, Harvey's independent French talent who lived in Paris were not as available as their competitors, therefore Uggie became a super star igniting a pet war.

Christopher Plummer, who had best supporting actor in the bag promoted his Jack Russell, Cosmo. Diminutive Scorsese was seen on TV on a small couch with his large Doberman, Blackie drooling on his suit. Spielberg never got a chance to trot out his lead horse Joey, previously seen in "Seabiscuit" because his ravishing reddish coat was now darkened for another role.

By December, as film critics bestowed their own awards upon many films, Stephen Daldry struggled to finish "Extremely Loud and Incredibly Close" with a new score. There was buzz Daldry could be editing the winner. Producer Scott Rudin juggled his astounding three films in one year from Daldry, Miller and David Fincher directing "The Girl with the Dragon Tattoo."

Daldry had received three consecutive directing nominations. In January, for his fourth film, he received a best picture nomination, for a boy's emotional journey dealing with 9/11, and the nine films were officially off and running. Forty-five film and media groups handed out awards leading up to Oscar night.

Wednesday, February 22

My airplane seatmate to LAX was Sony Classics Michael Barker. The night before Woody Allen had shown Michael "Nero Fiddled", his **latest** film shot in Rome rumored to be his best.

When Woody won the Oscar Sunday night, for a record breaking 23rd overall nomination, he had just finished pasta a Sette Mezzo on Lexington Avenue with art dealer Lorinda Ash and Soon-Yi. He went home and watched the N.B.A. All-Star game. Soon-Yi watched the awards show on a delay in another room. By the time Woody won, he fell asleep and Soon-Yi didn't want to wake him. The next morning he went to the breakfast table alone and read in The New York Times he won. He had to think it was a good omen and he would not catch a cold that day.

Before Michael and I flattened our recliner chairs for the big sleep, I told him I felt confident his Iranian film, "A Separation" was winning best foreign picture. He told me "The Artist" would take best picture and director. Actor was a tight race between Brad Pitt, Jean Dujardin, the "Clooney of France" and the real George Clooney. George was essentially running against a version of himself, which only slightly amused him.

The biggest dilemma was Viola vs. Meryl. Michael picked Meryl as New Yorkers did. "The Help" had taken on a life of its own lead by vivacious Viola in LA. "The Iron Lady", a much criticized film showcased Meryl's tour de force performance. Few knew at the last minute, on President's weekend Harvey's shout out, "She hasn't won in 29 years!" resonated.

An androgynous driver named Monica greeted me at the airport in a black tuxedo that would make Albert Nobbs weep for joy, prompting me to devilishly think of her as "Nobbs" all weekend. She barely recognized me sporting a new Sally Hershberger hairdo, "the yenta with the dragon tattoo."

Checking into the Beverly Hills Hotel I bumped into best actress nominee, Golden Globe and Spirit Award winner Michelle Williams with her daughter Matilda Ledger headed to the swimming pool. Innocently standing there with no makeup she was remarkably the antithesis of Marilyn Monroe. I told her she so deserved the Oscar for her mesmerizing transformation which did not cheer her up knowing the gold was going to Viola or Meryl.

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It was a busy night at the Chateau as French billionaire investor Nicolas Berggruen hosted his party for young, leggy, breathtakingly beautiful models. Lindsay Lohan was on the loose after a judge having announced she was making great progress. She showed up sober wearing a new face bloated with injectable Restalyne that could only be preparation to portray Elizabeth Taylor in "Liz and Dick", her film for Lifetime. Peter Brant and Stephanie Seymour and Peter Morton and Linda Evangelista joined Josh Harnett and Emile Hirsh under the terrace heaters. The boys were looking for love in all the right places.

Thursday, February 23

Thursday night boasted fifteen events causing party panic. Here is a brief rundown of **seven**.

At The Hollywood Reporters Nominees Night, editor Janice Min and publisher Lynne Segall greeted the power brokers. With ballots in, competing studios cordially **mingled in the mayor's backyard.** Owen Wilson slipped in the back door and hung with Michael Sheen and producer Letty Aronson. Producers Kathy Kennedy and Frank Marshall chatted with DreamWorks **partner Stacey Snyder, producer** Graham King **and** Emily Mortimer. Fox's Tom Rothman and Jim Gianopulos compared notes with Focus's James Shamus. Young directors Drake Doremus ("Like Crazy"), Sean Durkin ("Martha Marcy May Marlene") and Oscar nominee and Spirit Award winner J.C. Chandor ("Margin Call") **drank at the bar**. Breakout directors Nick Jarecki ("Arbitrage"), Zal Batmanglij ("Sound of My Voice and "The East") and Jay Duplass ("Jeff Who Lives at Home") dreamed about their future nominations. Aaron Sorkin, Piers Morgan and Lawrence O'Donnell handicapped Romney vs. Obama as Brooklyn Decker sashayed by.

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The US-Ireland Alliance honored nominees "Hugo" screenwriter John Logan, "Bridesmaids" star Melissa McCarthy and Michelle Williams at Bad Robot**.** Logan also wrote "Rango" "Coriolanus", 007's "Skyfall" and "Jersey Boys" for the big screen.

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Friday, February 24

At the BHH I ran into David Heyman, English producer of the "Harry Potter" franchise who was honored at the Publicists Awards lunch at The Beverly Hilton. "Motion Picture Showman of the Year" was the consolation prize for being snubbed by the Academy for visualizing a publishing miracle for children around the world.

"Nobbs" whisked me off to the British Film Reception hosted by Jeremy Hunt, UK Secretary for **Culture and Olympics,** and the British Consul-General Dame Barbara Hay, in her Hancock Park residence. Upon introduction, I blurted out that my friend Lord Astor, was interested in having LA people get to know his son-in-law, Prime Minister David Cameron. As an appointed diplomat she was horrified by my indiscretion and turned to greet the next American idiot. I was just making conversation.

Daldry told Sony's Sir Howard Stringer and astute film CEO Michael Lynton, Kenneth Branagh, Janet McTeer, **and** Gary Oldman that he, as executive producer of the Olympics, was headed back to London to oversee special events, including the opening ceremony, directed by Danny Boyle.

Victoria Beckham made a dramatic sullen last-minute appearance looking perfectly skinny in her own designed dress.

At the Women in Film party at Cecconi's, Gwyneth Paltrow, Shailene Woodley, Selena Gomez and Vanessa Hudgens networked with Jessica, Octavia and Viola now of social stamina fame.

Blythe Danner kissed me at the door as a military type looked on. I kept saying to him, "Where have we met?" Nowhere. He was astronaut Mark E. Kelly who came with Blythe and is married to former congresswoman Gabrielle Giffords, Paltrow's second cousin. Only I could mistake an astronaut for a movie marketing guy.

Vanity Fair feted Scorsese and The Film Foundation which has saved 555 films in 22 years. Cocktails were at the restored Bel-Air Hotel. Honorary Jewess Lorraine Bracco ran past me yelling she was late for Ronald Perelman's Shabbat dinner. Three, three-time Oscar winners: composer Howard Shore, costume designer Sandy Powell and editor Thelma **Schoonmaker** were honored. Sir Ben Kingsley, Danny Huston,

Patty Clarkson, Irwin Winkler and Giorgio Armani's niece Roberta Armani with Wanda McDaniels debated best director: Marty or Michel?

“Nobbs” delivered me to WME's Party at kahuna Ari Emanuel's Brentwood estate, where NFL quarterback and new client Tim Tebow was the toast of the party, especially to Taylor Swift who made $35.7 million this year. Michael Douglas gave me a kiss...**doesn’t get any better**. Lovebirds Robert Pattinson and Kristen Stewart made a rare appearance, glued to each other's hips. They mingled with co-star Taylor Lautner, Miley Cyrus and her "Hunger Games" beau Liam Hemsworth. Meanwhile Charlize Theron, Jack Black, Rooney Mara, Ben Stiller, Barry Sonnenfeld and Larry David talked business with moguls Les Moonves and Viacom's Philippe Dauman.

Next was UTA Chairman Jim Berkus' soiree that police almost shut down because the DJ got carried away impressing Harrison Ford, Channing Tatum, Jerry Bruckheimer, Tom Freston, Disney's Rich Ross, SNL's Lorne **Michaels** and Oscar show producer Brian Grazer.

Sunset Tower Hotel owner Jeff Klein and producer John Goldwyn hosted a secretive dinner for Anna and Graydon Carter at their Hollywood Hills home with Tom Ford, Mitch Glazer, Fran Lebowitz, Vito Schnabel, Denise Hale, Lisa and Eric Eisner and VF's Punch Hutton, who is Tim Hutton's sister. _____

Last stop was CAA Byran Lourd's "Friday Night Party". “Nobbs” was instructed to drop me off at a neighborhood school where a luxury van transported guests to the stone and glass Bel-Air estate situated on a narrow street. I knew that guests Colin Firth, Penelope Cruz, Sofia Vergara, Salma Hayek, Sandra Bullock, and Glee's Matthew Morrison did not arrive by bus. Once inside the playing field leveled out and pound for pound there was more famous flesh per square inch than **at** the Oscars themselves.

I huddled with Meryl on the couch and we talked about her race. She thought Viola. I thought Meryl. She didn't know about **Harvey’s** last minute "29 year" shout out.

I hugged Bette Midler, flirted with Jim Sturgess and Bennett Miller. Universal's Donna Langley, who is overseeing Tom Hooper's production "Les Miserable" mentioned Hugh Jackman's impeccable manners should insure best behavior from Russell Crowe.

I introduced HBO’s "Game Change" director Jay Roach who is **an** authority on Hitler, to George Clooney who is writing a thriller about the Nazis stealing art. Clooney whispered, “The Frenchman is winning.”

I thanked Bryan Lourd, Kevin Huvane and Richard Lovett, got on the bus and prayed that I get invited back.

Saturday, February 25

I dragged my tired ass to the Academy, as foreign films aficionado Mark Johnson was conducting a symposium on the nominated films, which included Sony Classic’s “In Darkness” from Poland, "Footnote" from Israel and "A Separation" from Iran. Israeli and Iranian governments from the other side of the world monitored their directors as the Sony boys kept the peace.

Michael and Tom Bernard invited me to the Independent Spirit Awards at the Santa Monica Pier. Michael hosted his "Take Shelter" nominees Jessica Chastain, Michael Shannon and director Jeff Nichols. Tom held **court** at the next table with the entire Iranian cast of "A Separation", which won. Tom

almost had a heart attack when I threw my arms around Iranian director Asghar Farhadi, which in Iran is unacceptable behavior especially by a Jewish American Princess. Tom wished I had gone to the crowded champagne brunch in honor of Prince Albert and Princess Charlene at the Bel-Air Hotel where Montblanc launched Grace Kelly watches. Simultaneously, TV producer Gary Pudney hosted another secretive lunch which Albert and Charlene actually attended with Graydon Carter, Carolina Herrera, Wallace Annenberg, Bobby Shriver, Bobby Marx, Kathy and Ricky Hilton and Lynn Wyatt. Wolfgang Puck joined them for dessert.

"The French," as the "The Artist" gang was nicknamed, had won six Cesars, France's version of the Oscars in Paris the night before. They flew all night and Harvey's chauffeur arranged a police escort from LAX just in time for them to win four Spirit Awards, cementing the Oscar win.

Back at the BHH, Spielberg was the first to arrive at the tenth annual "Night Before" fundraiser in support of the Motion Picture and Television Fund. Jeffrey Katzenberg had already secured $200 of a $350 million fundraising goal that included money from him, Tom Cruise, Steve Bing, Casey Wasserman, Clooney and Spielberg. Every nominee showed up.

Chanel and Charles Finch cooked up their chic soiree at Madeo, where a mariachi band enthusiastically announced everyone's arrival. Bedecked exclusively in Chanel were Diane Kruger, Rose Byrne, Ginnifer Goodwin, **and** Rachel Bilson . Also air kissing were Rachel Zoe, Rosanna Arquette, Alice Evans and Ioan Gruffudd, Zachary Quinto, and Julia Ormond.

Elizabeth Olsen who has six upcoming films, gushed to Dustin Hoffman that "Wag the Dog" was her favorite movie. I sat next to director, Michael Apted who was editing "Of Men and Mavericks," a surfer film he co-directed with Curtis Hanson.

"My Week With Marilyn's" English director Simon Curtis insisted we join Kenneth Branagh at The Weinstein Company's bash at the Soho House in time to hear Tony Bennett sing "Autumn Leaves" to Harvey's surprised 86 year-old mother Miriam, Madonna and Meryl. Jean Dujardin, Berenice Bejo, Michel Hazanavicius and producer Thomas Langmann staggered around completely jet lagged **and** too tired to speak English . Uggie on the other hand was the absolute star of the evening as his trainer placed him in everyone's arms for photo two shots. "W.E's" Andrea Riseborough and Abbie Cornish sat next to baseball cap-clad Leonardo DiCaprio as his ex Bar Refaeli kept her distance across the room. Zoe Saldana walked in holding hands with Bradley Cooper. Scarlett Johansson introduced me to her boyfriend Nate Naylor. Katy Perry, Felicity Jones and Malin Akerman circled a refreshed Gerard Butler. The two daughters of New York slain hero cop Peter Figoski, Corrine, 14 and Caroline, 16 who had also been Harvey's guests at the Super Bowl stood in the middle of this circus and just fainted.

Sunday, February 26

I met interior **designer** Nicky Haslam in the Polo Lounge and found Nancy Reagan brunching with Bob Colacello and Carolina Herrera. Nancy knows me as "The DVD Lady." I promised to send her "The Iron Lady". I didn't have the heart to tell her that her husband, who was Margaret Thatcher's best friend, was barely mentioned in the film.

In a Marchesa gown, Dennis Basso fur and Iradj Moini necklace, I collected Simon Curtis and headed to the Hollywood & Highland Center. Simon, who has never been to the Oscars before, miraculously scored a front row seat between Michelle **Williams** and Clooney. We pulled up to screams of hysteria at the

mother of all red carpets. We ended up in front of thousands of cameras and I instructed Simon to take baby steps for an hour.

Meryl's publicist Leslee Dart whispered to me. "She is dressed like an Oscar. What do we do if she loses?" Sacha Baron Cohen hilariously guilted the Academy into letting him wear his costume from "The Dictator" and after soiling Ryan Seacrest he went directly to dinner at Vanity Fair. Gwyeneth Paltrow won the style award in Tom Ford's white column and Angelina Jolie so successfully invented a new one legged pose in a thigh high slit gown on the red carpet she repeated it for 39.3 million people onstage. Tickets were so tight that I gave my plus one to Penelope Ann Miller because she promoted "The Artist" every day for four months. Seated next to us were co-stars James Cromwell and Missi Pyle.

Billy Crystal made us laugh, Cirque de Soleil made us gasp and most of the wins were expected. Colin Firth crowned Meryl her third win on a record 17 nominations and Harvey beamed. _____

The Academy was so confident "The Artist" would **win**; they invited Uggie, who waited in the wings and ran out as Tom Cruise announced the film.

Once the show was off the air, I followed my seatmates to the stage loaded with their programs, wraps and handbags and led the French to the press rooms.

The Governor's Ball was the next stop where the winners got their Oscars engraved. Everyone paid respects to the Academy's Tom Sherak and Dawn Hudson. Stars headed to the Sunset Tower to Graydon's glittering Vanity Fair Oscar bash and their militarized security with micro chipped cards. If your name was not on the list and you were carrying an Oscar, you could walk in. Billy and Janice Crystal were mobbed with **well-wishers**. Elton John made $5 million dollars at his 20th AmFar event which also auctioned off two tickets to Vanity Fair's party for $230 thousand dollars. Tom Cruise and Katie Holmes were thrilled to talk to George Lucas. Gwyneth snuggled with Coldplay's Chris Martin and Jennifer Lopez brought boy-toy Casper Smart. Every major actor previously mentioned was standing in the room. In a sea of celebrity were Tina Fey, David Beckham, Glenn Close, Terry George, Demian Bichir, Claire Danes, Meryl's daughters Mamie Gummer with **husband** Ben Walker**,** Grace Gummer, Salma Hayek, Brit Marling, Natalie Portman, Sofia Coppola, Ryan Kavanaugh, Ingrid Sischy, Sandy Brant and Wendi Murdoch with Bingbing Li.

George Clooney threw his own exclusive party at Craig's in West Hollywood for close friends Bryan Lourd, Grant Heslov, Stan Rosenfield, Brad and Angelina, Emily Blunt and John Krasinski, Cindy Crawford, Jimmy Kimmel, Ryan Seacrest and best adapted screenplay winner Alexander Payne. As much as George supported "The Descendants" he and Brad seemed to have cancelled each other out this year with two great performances.

"The French" and their closest 200 threw their own wild celebration at the Chateau, poured champagne down their throats and threw each other in the pool at 3:00am. Nobody spoke a word of English.

By 4:00am Harvey rounded his talent up for a live broadcast on "The Today Show" from The Four Seasons lobby. In disheveled black tie five Oscar winners and Berenice Bejo, who were total unknowns a year ago made Oscar history with the first silent film to win since 1927. This had to be the most exciting

night of their lives. Tomorrow they all go back to **reality** but the glory and the memories will live on forever. As an Oscar winner, **who cares about a cold?**

Uggie was invited to the White House correspondent's dinner as a guest of the Washington Times in April. He hopes to meet President Obama.

VIVE L'OSCARS

Winner Woody Allen may have missed Hollywood's biggest lovefest, but intrepid über movie publicist Peggy Siegal was there for every single party and every single step of the red carpet way. This year, her exclusive Oscar diary chronicles close encounters with Michelle Williams, Meryl Streep, Harvey Weinstein, Nancy Reagan, Elizabeth Olsen, George Clooney and his French doppelganger Jean Dujardin and, of course, Uggie.

photographs by **Patrick McMullan** *and* **Billy Farrell Agency**

Katie Holmes and Tom Cruise

Octavia Spencer, *The Help* Director Tate Taylor, Viola Davis and George Clooney

Navigating our presidential campaign was a piece of cake compared to understanding the nuances of the 2011 Oscar race for the most revered artistic honor in the world.

This is how nine films fell into the big picture.

Three premiered in Cannes mid-May, a distant nine months ago, creating an Oscar campaign as long as any human pregnancy. At the Palais, the first inkling of Oscar buzz was born as the reclusive **Woody Allen** premiered *Midnight in Paris*. PBS later aired a documentary of Woody discussing his forty-four films showing the astonishing depth of his talent that made you want to immediately hand him the Oscar for Best Picture. Academy rules and Woody forbade marketing this gem.

Woody is not a member of the Academy becase he doesn't feel that films should be in competition. He told me, "A statue does not change your life. You still get a cold. You can't get a date. You still have everyday things to worry about." The Academy learned to love him from a distance and gave him Best Original Screenplay as a consolation.

Terrence Malick's long-awaited, esoteric *The Tree of Life* was unveiled at Cannes and won the coveted Palme D'Or, positioning it for a nomination.

The Artist, created by the French, shot in Hollywood and about Hollywood was the festival surprise. This charming and oddly original black-and-white silent entry was introduced by the ringmaster himself, **Harvey Weinstein**. No one could pronounce or spell director **Michel Hazanavicius**'s name. **Jean Dujardin** could not speak a word of English and neither could his 10-year-old co-star, the Jack Russell **Uggie** who had been rescued from the pound after two adopters found him too wild. Tragically Uggie developed an undisclosed neurological disorder during production, forcing him to retire at the height of his popularity.

No slam dunk Oscar winner emerged in Cannes. Any future film could easily win.

DreamWorks' *The Help* premiered in LA in August and distributor Disney began propelling the politically correct and socially significant film to box office heaven of $200 million. **Viola Davis** and **Octavia Spencer** were forecast to win Oscars.

In September, the Toronto and New York Film Festivals and Fox Searchlight presented **Alexander Payne**'s Hawaiian family saga, *The Descendants*, which broke out of the pack with whispers of winning. Beloved **George Clooney**, playing a father for the first time was hailed as a shoo-in for best actor. Directing *Ides of March* added momentum.

Also at New York's festival **Marty Scorsese** and Paramount sneaked an unfinished cut of *Hugo* in Alice Tully Hall, built for concerts but converted into a 3-D theater. Marty was christened the visionary genius of an innovative, costly 3-D masterpiece.

Director **Bennett Miller**'s highly anticipated *Moneyball* for Sony hit a grand slam at its west coast premiere in

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Oakland putting the film, its heart throb star **Brad Pitt**, **Jonah Hill** and seasoned writers **Steve Zaillian** and **Aaron Sorkin** in play.

Spielberg's epic *War Horse* for DreamWorks came thundering down the pike with a huge premiere back at Alice Tully Hall, with posters of Lincoln Center's Tony winning theatrical version and their indelible puppets in the background. Steven paid homage to legends **John Ford** and **David Lean** and the country fell in love with a horse named **Joey** and his 14 stand-ins.

Studios worked their stars to the bone. Ironically, Harvey Weinstein's independent French talent who lived in Paris were not as available as their competitors, therefore Uggie became a superstar igniting a pet war.

Christopher Plummer, who had Best Supporting Actor in the bag promoted his Jack Russell, **Cosmo**. Diminutive Scorsese was seen on TV on a small couch with his large Doberman, **Blackie**, drooling on his suit. Spielberg never got a chance to trot out his lead horse Joey, previously seen in *Seabiscuit* because his ravishing reddish coat was now darkened for another role.

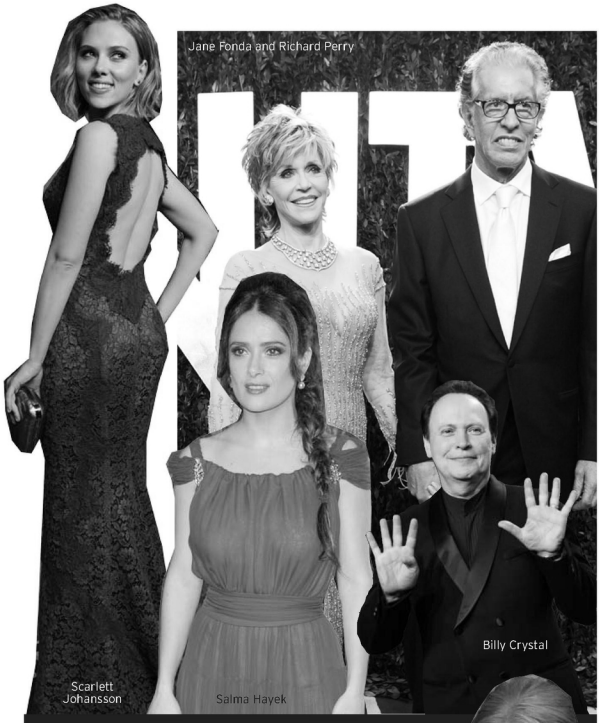
By December, as film critics bestowed their own awards upon many films, **Stephen Daldry** struggled to finish *Extremely Loud and Incredibly Close* with a new score. There was buzz Daldry could be editing the winner. Producer **Scott Rudin** juggled his astounding three films in one year from Daldry, Miller and **David Fincher** directing *Girl with the Dragon Tattoo.*

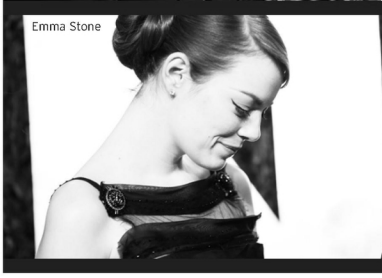
Daldry has received three consecutive directing nominations. In January, for his fourth film, he received a Best Picture nomination, for a boy's emotional journey dealing with 9/11, and the nine films were officially off and running. Forty-five film and media groups handed out awards leading up to Oscar night.

Martin Scorcese
Meryl Streep
Lily Collins
Berenice Bejo and Michel Hazanaviciu
Michelle Williams
Princess Charlene and Prince Albert II of Monaco
Brad Pitt and Angelina Jolie
David and Victoria Beckham

WEDNESDAY, FEBRUARY 22

My airplane seatmate to LAX was Sony Classics **Michael Barker**. The night before Woody Allen had shown Michael *To Rome With Love*, his new film shot in Rome and rumored to be his best. When Woody won the Oscar Sunday night, for a record breaking 23rd overall nomination, he had just finished pasta at *Sette* Mezzo on Lexington Avenue with art dealer **Lorinda Ash** and **Soon-Yi**. He went home and watched the N.B.A. All-Star game. Soon-Yi watched the awards show on a TiVo delay in another room.





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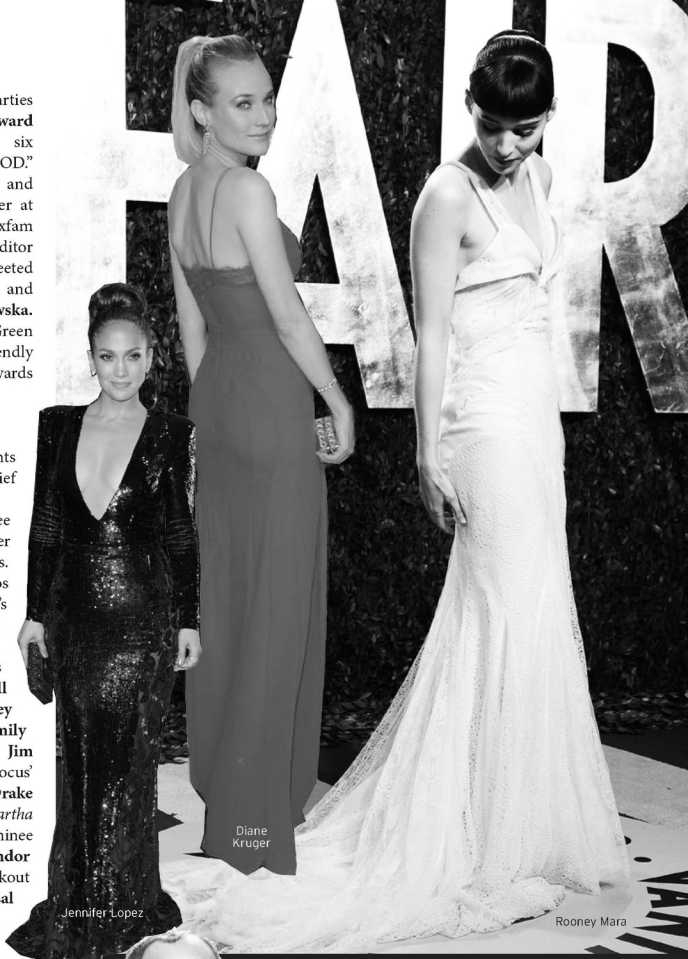

Diane Kruger

Jennifer Lopez

Rooney Mara

Terry Richardson

Graydon Carter and Anna Scott

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Stunning socialite **Betsey Bloomingdale** gave a seated dinner at her Holmby Hills home for best friends **Nancy Reagan**, **Wendy Stark**, **Bob Colacello**, **Joan Collins** and fashion icon **Lynn Wyatt**.

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FRIDAY, FEBRUARY 24

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made a dramatic, sullen, last-minute appearance looking perfectly skinny in a dress from her eponymous collection.

At the Women in Film cocktail party at Cecconi's, **Gwyneth Paltrow**, **Shailene Woodley**, **Selena Gomez** and **Vanessa Hudgens** networked with Jessica, Octavia and Viola now of social stamina fame.

Blythe Danner kissed me at the door as a military-type looked on. I kept saying to him, "Where have we met?" Nowhere. He was astronaut **Mark E. Kelly** who came with Blythe and is married to former congresswoman **Gabrielle Giffords**, Paltrow's second cousin. Only I could mistake an astronaut for a movie marketing guy.

Vanity Fair fêted Scorsese and The Film Foundation, which has saved 555 films in 22 years. Cocktails were at the restored Bel-Air Hotel. Honorary Jewess **Lorraine Bracco** ran past me yelling that she was late for **Ronald Perelman**'s Shabbat dinner. Three, three-time Oscar winners: composer **Howard Shore**, costume designer **Sandy Powell** and editor **Thelma Schoonmaker** were honored. **Sir Ben Kingsley, Danny Huston**, **Patty Clarkson**, **Irwin Winkler** and **Giorgio Armani**'s niece **Roberta Armani** with **Wanda McDaniels** debated best director: Marty or Michel?

Zoe Saldana

"Nobbs" delivered me to WME's Party at kahuna **Ari Emanuel**'s Brentwood estate, where NFL quarterback and new client **Tim Tebow** was the toast of the party, especially to **Taylor Swift** who made $35.7 million this year. **Michael Douglas** gave me a kiss… doesn't get any better. Longtime lovebirds **Robert Pattinson** and **Kristen Stewart** made a rare appearance, glued to each other's hips. They mingled with co-star Taylor Lautner, **Miley Cyrus,** and her *Hunger Games* beau **Liam Hemsworth**. Meanwhile **Charlize Theron**, **Jack Black**, **Rooney Mara**, **Ben Stiller**, **Barry Sonnenfeld** and **Larry David** talked business with moguls **Les Moonves** and Viacom's **Philippe Dauman**.

Next was UTA Chairman **Jim Berkus**' soiree that police almost shut down because the DJ got carried away impressing **Harrison Ford**, **Channing Tatum**, **Jerry Bruckheimer**, **Tom Freston**, Disney's **Rich Ross**, SNL's **Lorne Michaels** and Oscar show producer **Brian Grazer.**

Felicity Jones
Brooklyn Decker
Miley Cyrus

Sunset Tower Hotel owner **Jeff Klein** and producer **John Goldwyn** hosted a secret dinner for **Anna** and **Graydon Carter** at their Hollywood Hills home with **Tom Ford**, **Mitch Glazer**, **Fran Lebowitz**, **Vito Schnabel**, **Denise Hale, Lisa** and **Eric Eisner** and VF's **Punch Hutton,** who is **Tim Hutton**'s sister.

Last stop was CAA **Byran Lourd**'s "Friday Night Party". "Nobbs" was instructed to drop me off at a neighborhood school where a luxury van transported guests to the stone and glass Bel-Air estate situated on a narrow street. I knew that guests **Colin Firth**, **Penelope Cruz**, **Sofia Vergara**, **Salma Hayek, Sandra Bullock**, and *Glee*'s **Matthew Morrison** did not arrive by bus. Once inside the playing field leveled out and pound for pound there was more famous flesh per square inch than the Oscars themselves.

I huddled with Meryl on the couch and we talked about her race. She thought Viola. I thought Meryl. She didn't know about Harvey's last-minute "29 year" shout out.

I hugged **Bette Midler** and flirted with **Jim Sturgess** and **Bennett Miller.** Universal's **Donna Langley,** who is overseeing **Tom Hooper**'s production *Les Miserables*, mentioned **Hugh Jackman**'s impeccable manners should insure best behavior from Russell Crowe.

I introduced HBO's *Game Change* director **Jay Roach**, who is an authority on Hitler, to **George Clooney** who is writing a thriller about the Nazis stealing art. Clooney whispered, "The Frenchman is winning."

I thanked **Bryan Lourd**, **Kevin Huvane** and **Richard Lovett**, got on the bus and prayed that I get invited back.

SATURDAY, FEBRUARY 25

I dragged my tired ass to the Academy, as foreign film aficionado **Mark Johnson** was conducting a symposium on the nominated films, which included Sony

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Natalie Portman

Olivia Wilde

Colin Firth and Livia Giuggiolo

Classic's *Footnote* from Israel and *A Separation* from Iran. From the other side of the world both governments monitored their directors as the Sony boys kept the peace.

Michael and **Tom Bernard** invited me to the Independent Spirit Awards at the Santa Monica Pier. Michael hosted his *Take Shelter* nominees **Jessica Chastain, Michael Shannon** and director **Jeff Nichols**. Tom held court at the next table with the entire Iranian cast of *A Separation*, which won. Tom almost had a heart attack when I threw my arms around Iranian director **Asghar Farhadi**, which in Iran is unacceptable behavior, especially by a Jewish American Princess. Tom wished I had gone to the crowded champagne brunch in honor of **Prince Albert** and **Princess Charlene** at the Bel-Air Hotel where Montblanc launched Grace Kelly watches. Simultaneously, TV producer **Gary Pudney** hosted another secretive, lunch which Albert and Charlene actually attended with Graydon Carter, **Carolina Herrera, Wallace Annenberg, Bobby Shriver, Bobby Marx, Kathy** and **Ricky Hilton** and **Lynn Wyatt**. **Wolfgang Puck** joined them for dessert.

"The French," as the *The Artist* gang was nicknamed, had won six Césars, France's version of the Oscars, in Paris the night before. They flew all night and Harvey's chauffeur arranged a police escort from LAX just in time for them to win four Spirit Awards, cementing the Oscar win.

Back at the BHH, Spielberg was the first to arrive at the tenth annual "Night Before" fundraiser in support of the Motion Picture and Television Fund. **Jeffrey Katzenberg** had already secured $200 of a $350 million fundraising goal that included money from him, **Tom Cruise, Steve Bing, Casey Wasserman**, Clooney and Spielberg. Every nominee showed up.

Chanel and **Charles Finch** cooked up their chic soiree at Madeo, where a mariachi band enthusiastically announced everyone's arrival. Bedecked exclusively in Chanel were **Diane Kruger, Elizabeth Olsen, Rose Byrne, Ginnifer Goodwin** and **Rachel Bilson.** Also air kissing were **Rachel Zoe, Rosanna Arquette, Alice Evans** and **Ioan Gruffudd, Zachary Quinto, Julia Ormond** and **Dustin Hoffman**.

My Week With Marilyn's English director **Simon Curtis** insisted we join **Kenneth Branagh** at The Weinstein Company's bash at the Soho House in time to hear **Tony Bennett** sing "Autumn Leaves" to Harvey's surprised 86-year-old mother **Miriam, Madonna** and **Meryl**. **Jean Dujardin, Bérénice Bejo, Michel Hazanavicius** and producer **Thomas Langmann** staggered around completely jet lagged, too tired to speak English. **Uggie** on the other hand was the absolute star of the evening as his trainer placed him in everyone's arms for photos. *W.E*'s **Andrea Riseborough** and **Abbie Cornish** sat next to baseball cap-clad **Leonardo DiCaprio** as his ex, **Bar Refaeli**, kept her distance across the room. **Zoe Saldana** walked in holding hands with **Bradley Cooper**. **Scarlett Johansson** introduced me to her boyfriend **Nate Naylor**. **Katy Perry, Felicity Jones** and **Malin Akerman** circled a refreshed **Gerard Butler**. The two daughters of New York slain hero cop **Peter Figoski**, Corrine, 14 and Caroline, 16 who had also been Harvey's guests at the Super Bowl stood in the middle of this circus and just fainted.

SUNDAY, FEBRUARY 26

I met interior designer **Nicky Haslam** in the Polo Lounge and found **Nancy Reagan** brunching with **Bob Colacello** and **Carolina Herrera**. Nancy knows me as "The DVD Lady". I promised to send her *The Iron Lady*. I didn't have the heart to tell her that her late husband, who was **Margaret Thatcher**'s best friend, was barely mentioned in the film.

In a Marchesa gown, Dennis Basso fur and Iradj Moini necklace, I collected **Simon Curtis** and headed to the Hollywood & Highland Center. Simon, who has never been to the Oscars before, miraculously scored a front row seat between Michelle Williams and Clooney. We pulled up to screams of hysteria at the mother of all red carpets.

Meryl's publicist **Leslee Dart** whispered to me. "She is dressed like an Oscar. What do we do if she loses?" **Sacha Baron Cohen** hilariously guilted the Academy into letting him wear his costume from *The Dictator* and, after soiling **Ryan Seacrest**, he went directly to dinner at *Vanity Fair*. **Gwyneth Paltrow** won the style award in Tom Ford's white column and **Angelina Jolie** so successfully invented a new one legged pose in a thigh high slit gown on the red carpet she repeated it for 39.3 million

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I introduced HBO's Game Change director Jay Roach, who is an authority on Hitler, to George Clooney who is writing a thriller about the Nazis stealing art. Clooney whispered, "The Frenchman is winning."

people onstage.

Tickets were so tight that I gave my plus one to **Penelope Ann Miller** because she promoted *The Artist* every day for four months. Seated next to us were co-stars **James Cromwell** and **Missi Pyle**.

Billy Crystal made us laugh, Cirque de Soleil made us gasp and most of the wins were expected.

Colin Firth crowned Meryl her third win on a record 17 nominations and Harvey beamed.

The Academy was so confident *The Artist* would win, they invited Uggie, who waited in the wings and ran out as **Tom Cruise** announced the film.

Once the show was off the air, I followed my seatmates to the stage loaded with their programs, wraps and handbags and led the French to the press rooms.

The Governor's Ball was the next stop where the winners got their Oscars engraved. Everyone paid respects to the Academy's **Tom Sherak** and **Dawn Hudson**. Stars headed to the Sunset Tower to Graydon's glittering Vanity Fair Oscar bash and their militarized security with micro chipped cards. If your name was not on the list and you were carrying an Oscar, you could walk in. **Billy** and **Janice Crystal** were mobbed with well wishers. **Elton John** made $5 million dollars at his 20th AmFar event which also auctioned off two tickets to Vanity Fair's party for $230,000.**Tom Cruise** and **Katie Holmes** were thrilled to talk to **George Lucas**. Gwyneth snuggled with Coldplay's **Chris Martin** and **Jennifer Lopez** brought boy toy **Casper Smart.** Every major actor previously mentioned is standing in the room. Spotted in a sea of celebrity were **Tina Fey**, **Glenn Close**, **Olivia Wilde** and **Jason Sudeikis**, **Terry George, Jane Fonda**, **Demian Bichir**, **Claire Danes,** Meryl's daughters **Mamie Gummer** with husband **Ben Walker**, **Grace Gummer**, **Salma Hayek**, **Brit Marling, Natalie Portman**, **Sofia Coppola**, **Peter Brant**, **Stephanie Seymour**, **Ryan Kavanaugh**, **Ingrid Sischy**, **Sandy Brant** and **Wendi Murdoch** with **Bingbing Li**.

George Clooney threw his own exclusive after party at Craig's in West Hollywood for close friends **Bryan Lourd**, **Grant Heslov**, **Stan Rosenfield**, **Brad** and **Angelina**, **Emily Blunt** and **John Krasinski**, **Cindy Crawford**, **Jimmy Kimmel**, **Ryan Seacrest** and best adapted screenplay winner **Alexander Payne**.

George and Brad cancelled each other out with two great performances. Clooney immediately returned to his best role as humanitarian, flew to the Sudan, met with Obama and was dramatically arrested at a protest.

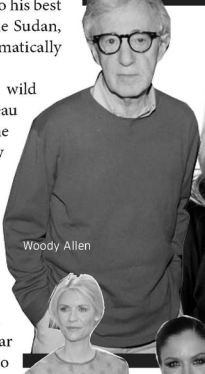
"The French" threw a wild celebration at the Chateau Marmont, poured champagne down their throats and threw each other in the pool at 3:00 a.m. Nobody spoke English.

By 4:00 a.m. Harvey rounded up his artists for a live broadcast on *The Today Show* from The Four Seasons lobby. In disheveled black tie, five Oscar winners, all total unknowns a year ago, made Oscar history with the first silent film to win since 1927.

It wasn't God, but 5,800 Academy voters who said they won. This had to be the most exciting night of their lives. The glory and memories live forever. The next day they went back to reality . As Woody says, "A statue does not really change your life. You still get a cold."

Uggie was invited to the White House correspondent's dinner as a guest of the Washington Times in April. He hopes to meet President Obama. ✦

Jean Dujardin


Woody Allen

Elizabeth Olsen

Claire Danes

Georgina Chapman and Harvey Weinstein

From: Boris Nikolic [redacted]
Sent: 3/23/2012 7:10:58 PM
To: Jeffrey Epstein (jeevacation@gmail.com) [jeevacation@gmail.com]
Subject: FW: World Bank Nominee
Attachments: image005.jpg; image006.jpg

Importance: High

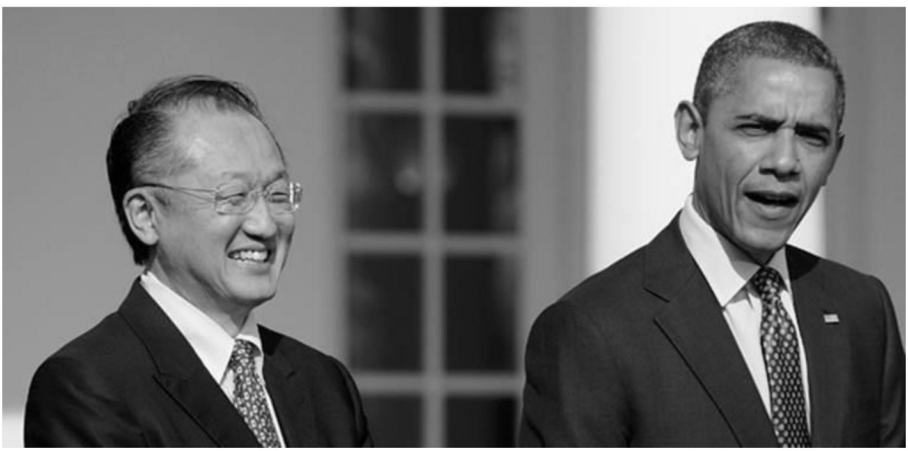
The Atlantic Home
Friday, March 23, 2012

- Politics

Massoud Hayoun - Massoud Hayoun writes for and produces *The Atlantic*'s International channel.

How Jim Yong Kim, Obama's World Bank Pick, Changed Global Health Aid

By Massoud Hayoun
Mar 23 2012, 2:04 PM ET
The international public health work that made Kim, now the president's nominee for World Bank head, such a respected figure.



President Obama introduces Jim Yong Kim as his nominee to be the next president of the World Bank / Reuters

President Obama announced today that he will nominate Dartmouth College President Jim Yong Kim to head the World Bank. Although Kim is a physician by training, officials have observed that Kim's role as a key player in global health and development, notably with his role in the organization Partners in Health (PIH), makes him a key candidate to change the attitudes of developing-world nations.

The following excerpts from Tracy Kidder's *Mountains Beyond Mountains*, a biography of anthropologist and physician Paul Farmer, detail Kim's bold efforts to combat international HIV and tuberculosis epidemics with PIH:

Some months after the official founding of PIH, [co-founder] Paul Farmer expanded the group, adding a fellow Harvard anthropology and medical student, a Korean American named Jim Yong Kim... Farmer offered what for Jim Kim was a convincing vision of the new organization. The reality was less impressive -- a charity with a board of advisers and no hired staff...

They talked about issues such as political correctness, which Jim Kim defined as follows: "It's a very well-crafted tool to distract us. A very self-centered activity. Clean up your own vocabulary so you can show everybody you have the social capital of having been in circles where these things are talked about on a regular basis." (What was an example of political correctness? Some academic types would say to Jim and Paul, "Why do you call your patients poor people? They don't call themselves poor people." Jim would reply: "Okay, how about soon-dead people?")

They talked about the insignificance of "cultural barriers" when it came to the Haitian peasant's acceptance of modern Western medicine: "There's nothing like a cure for a disease to change people's cultural values"...

By now Peru was taxing PIH's resources severely. On average, the drugs to treat just one patient cost between fifteen and twenty thousand dollars. And the number of patients kept growing. Already there were about fifty Carabayllanos in treatment. Their average age was twenty-nine. They were students, unemployed youths, housewives, street vendors, bus drivers, health workers. The actual numbers seemed small, but those fifty MDR [a form of tuberculosis that does not respond to standard treatment] cases represented about 10 percent of all active cases of TB in the slum, about ten times more than might have been expected. No telling how many others they had been infecting as they'd traveled around Lima, coughing. No telling either how many people in other parts of the city already had MDR, but [there were] reports of hundreds in other neighborhoods. In Carabayllo itself, the Socios workers found entire families sick and dying with what turned out to be genetically related strains of the disease--a phenomenon common enough that the health workers gave it a name, familias tebeceanas, tuberculosis families.

Kim's organization confronted Peru's MDR-form tuberculosis epidemic with what some have called unorthodox practices -- borrowing and cajoling its way into medicine for its patients.

Howard Hiatt, a friend of Jim Yong Kim's and a former dean at the Harvard School of Public Health, said he was concerned about how PIH was getting medicine to combat the epidemic:

"Sure enough. Paul and Jim would stop at the [Harvard-affiliated] Brigham pharmacy before they left for Peru and fill their briefcases with drugs. They had sweet-talked various people into letting them walk away with the drugs." [Hiatt] was amused, all in all. "That's their Robin Hood attitude." In fact, they'd only borrowed the drugs...

Then one day the president of the Brigham stopped Hiatt in a corridor. "Your friends Farmer and Kim are in trouble with me. They owe this hospital ninety-two thousand dollars." Hiatt looked into the matter. "Sure enough. Paul and Jim would stop at the Brigham pharmacy before they left for Peru and fill their briefcases with drugs. They had sweet-talked various people into letting them walk away with the drugs." He was amused, all in all. "That's their Robin Hood attitude."

To many seasoned managers of public health projects, what Farmer and Kim were doing would have looked quite reckless--like a stunt, as some would later insinuate. They didn't have a guaranteed supply of drugs, only the determination to obtain the drugs and the charm to get away with borrowing. They were borrowing their laboratory services, too, from Massachusetts. They lacked proper institutional support. The weight of expert opinion stood against them. Their organization was small and it had other projects, in Haiti and Boston and elsewhere, and Peru put a strain on everyone. Jim had to travel to Carabayllo at least once a month. Farmer had to go there slightly more often.

Kim's audacious 'Robin Hood attitude' won him and PIH acclaim for their role in changing global health and development.

In June 2002 ... the WHO adopted new prescriptions for dealing with MDR-TB, virtually the same as PIH had used in Carabayllo. For Jim Kim this marked the end of a long campaign. "The world changed yesterday," he wrote from Geneva to all of PIH. The prices of second-line antibiotics continued to decline, and the drugs now flowed fairly smoothly through the Green Light Committee to, among other places, Peru, where about 1,000 chronic patients were either cured or in treatment. About 250 were receiving the drugs in Tomsk, and, largely because of the efforts of WHO, the Russian Ministry of Health had finally agreed to the terms of the World Bank's TB loan--150 million dollars to begin to fight the epidemic throughout the country.

The twin pandemics of AIDS and tuberculosis raged on, of course, magnifying each other, in Africa and Asia, Eastern Europe and Latin America. Mathematical models predicted widening global catastrophe--100 million HIV infections in the world by the year 2010. Some prominent voices, some in the U.S. government, still argued that AIDS could not be treated in desperately impoverished places. But this view seemed to be fading. The prices of antiretrovirals were falling, even more dramatically than the prices of second-line TB drugs.

This was thanks to a growing worldwide campaign for treating AIDS wherever it occurred. Jim Kim had often said that the world's response to AIDS and TB would define the moral standing of his generation. In 2003, a new director general took over at WHO, and he asked Jim to serve as his senior adviser. Meanwhile, the example of Zanmi Lasante [PIH's Haiti-based project] was growing, and Cange had become a favorite destination for global health policy makers and American politicians.

AFFIDAVIT OF BRADLEY JAMES EDWARDS

1. I am an attorney in good standing with the Florida Bar and admitted to practice in the Southern District of Florida. I am a partner in the law firm of Farmer Jaffe Weissing Edwards Fistos and Lehrman.

2. I am the lead attorney currently representing "Jane Doe" in the case of Jane Doe v. Jeffrey Epstein, case number 08-80893 in federal Court in the Southern District of Florida. I am the lead attorney representing Jane Doe, whose civil complaint alleges that Epstein sexually molested her numerous occasions when she was a minor.

3. Defendant Epstein has entered into a "non-prosecution agreement" (NPA) with the federal government for sex crimes against minors. Under that agreement, the federal government has agreed not to file criminal charges against Epstein for sex crimes committed against approximately thirty girls, including Jane Doe. In exchange, Epstein agreed to plead guilty to state law criminal charges involving solicitation of prostitution and procuring a minor for prostitution. The victim of the criminal charges to which he has pled was not Jane Doe.

4. Under the NPA, Epstein has agreed not to contest civil liability of any of his approximately thirty victims – provided that the victim agrees to limit themselves to the damages provided by 18 U.S.C. § 2255 (currently set at $150,000). Jane Doe has not agreed to limit herself to pursuing only $150,000 in damages. Therefore, the terms of the NPA purport to prevent Jane Doe from using the NPA to prove liability.

5. Epstein has filed an answer to Jane Doe's complaint, in which he has invoked his Fifth Amendment right to silence with respect to the allegations that he molested her as a child. Epstein has further argued that this Fifth Amendment invocation is the functional equivalent of, and must be treated as, a specific denial of the allegations.

6. Defendant Epstein's deposition has been taken on several occasions, in this and other related cases, and he has not provided any substantive discovery whatsoever. Instead, he invoked his 5th amendment privilege against self-incrimination when asked questions about his abuse of Jane Doe or other girls.

7. Defendant Epstein has also been served with Interrogatories and requests for production; all requests have been met with 5th amendment assertions and Epstein has not given Jane Doe any substantive testimony related her allegations.

8. Jane Doe's complaint contains a punitive damages claim, and Mr. Epstein has also elected to invoke the 5th Amendment on all questions that would relate to punitive damages issues, such as his intent when committing the crimes, his lack of remorse and his intent to recidivate.

9. Epstein has taken Jane Doe's deposition. During that deposition he has asked numerous questions of Jane Doe that suggest that she is fabricating her allegation of abuse by Epstein.

10. In addition to deposing Mr. Epstein, other attorneys and I have taken the depositions of his various co-conspirators (as labeled by the federal government in the NPA), including [redacted], [redacted] and [redacted]. Each of those individuals was employed by Epstein to bring him underage girls for him to molest and to ensure that he was protected from detection by law enforcement, and thus those individuals could likely provide general testimony that would assist Plaintiff in proving liability and damages, including punitive damages. However, none of these individuals were

present during acts of sexual abuse by Epstein. In any event, ALL of those individuals have also invoked their 5th amendment rights against self-incrimination, and thus have left Plaintiff with no information about what Epstein or other conspirators inside his house were doing during the sexual abuse of Jane Doe and other minors girls. This creates a serious issue for Jane Doe in proving her sexual molestation claim against Epstein. By its nature, sexual molestation takes place in private, with only the abuser and the victim typically available to testify. In this case, Epstein's abuse of Jane Doe took place in private, with only Epstein and Jane Doe present during the abuse. Jane Doe has no other reasonable avenues of discovery to provide direct proof of claim of sexual abuse by Epstein.

11. Additionally, Mr. Epstein has recently filed a lawsuit against me personally that has no merit whatsoever, a fact known to Mr. Epstein and his attorneys. He filed the lawsuit against Brad Edwards, Scott Rothstein, and [redacted] (another Epstein victim of his molestation). That lawsuit implies that L.M.'s civil case against him (currently pending in Florida state court) is fabricated and that [redacted] and I have conspired to commit fraud against him (presumably that she made up the case against him, implying that he does not know [redacted]. While the present subpoena before the Court has been filed by Jane Doe, the Court should be aware that attorneys representing [redacted] may also file a subpoena for the George Rush tape shortly.

12. Despite Mr. Epstein and all of his co-conspirators, asserting a 5th amendment privilege against self-incrimination, George Rush of the New York Daily news did contact me to inform me that Mr. Epstein spoke personally with him about issues related to the various charges of sex abuse against him.

13. Paraphrasing from memory of my conversation with Mr. Rush, Mr. Epstein told him that he may have come "too close to the line" but that he should not have been punished as severely as he was and that his conduct was at most worthy of a $100 fine. This is a statement that shows two things of great importance to Jane Doe's pending civil action. First, it is in effect an admission by Epstein of his liability to Jane Doe for sexually abusing her. Jane Doe does not have any other admission of Epstein of his sexual abuse of her and Epstein has filed an answer to Jane Doe's complaint that has the functional effect of denying abuse of her. Jane Doe has diligently pursued all possible ways of obtaining an admission from Epstein of his molestation of Jane Doe without success. Second, the statement to Mr. Rush is a clear demonstration that Epstein lacks remorse for committing felony child molestation against Jane Doe. This will be a central issue in the punitive damages case against Epstein at trial. Here again, Jane Doe has diligently pursued all possible ways of obtaining a statement from Epstein about his lack of remorse for abusing Jane Doe without success. There are no other reasonable means of obtaining a statement from Epstein on these subjects.

14. Mr. Rush also told me that Mr. Epstein spoke specifically about one of my clients, [redacted] and he made derogatory remarks about her.

15. Additionally, Mr. Rush said that Epstein spoke directly about another civil case that was filed against him (Jane Doe 102 v. Epstein); that case alleges that Epstein repeatedly sexually abused a 15 year old girl, forced her to have sex with his friends and flew her on his private plane nationally and internationally for the purposes of sexually molesting and abusing her. Epstein flippantly told George Rush that that case was dismissed, in a way to indicate that the allegations are ridiculous and untrue.

16. Mr. Rush indicated that he taped the conversation between him and Mr. Epstein.

17. Mr. Rush also spoke at length to Michael Fisten, an investigator with my firm that was assisting with the investigation of the case. Mr. Fisten reported to me shortly after the conversation with Mr. Rush that he had such a conversation.

18. While research by other plaintiffs' attorneys and myself has uncovered other persons that were acquaintances of Mr. Epstein, specifically Donald Trump, Alan Dershowitz, Bill Clinton, Tommy Mottola, and David Copperfield, we have no information that any of those people (other than Mr. Dershowitz) have spoken to Mr. Epstein about Jane Doe or any of the other specific victims of Mr. Epstein's molestation. Mr. Dershowitz is acting as an attorney for Mr. Epstein, and therefore it is presumably unlikely to question him about any admissions that Epstein may have made regarding Jane Doe or other minors girls. Additionally, we have no information that any of those individuals or any other individuals have any taped statements of Epstein's own voice relating to these matters. George Rush's taped conversation with Mr. Epstein is the only known one in existence, making it very unique and it contains information not otherwise obtainable through other means or sources. Indeed, without the Rush tape conversation, the jury that handles the case will not hear any words from Epstein himself about his abuse of Jane Doe and other young girls. I have been informed by Epstein's attorney that Epstein intends to invoke his Fifth Amendment rights rather than answer any substantive questions about the abuse of Jane Doe and other girls at trial.

19. The Rush interview is, in any event, unique and not otherwise obtainable from other witnesses because it can be used to prove perjury (a federal crime) on the part of Epstein. Epstein lied about not knowing George Rush. See deposition of Jeffrey Epstein, taken in [redacted] v. Jeffrey Epstein, case 50-2008-CA-028051, page 154, line 4 through 155 line 9, wherein Jeffrey Epstein clearly impresses that he does not recognize George Rush from the New York Daily News, despite the fact that he gave a personal interview that we all now know to have been tape recorded. It is therefore evidence of a criminal event. If we receive the tape, we intend to alert the appropriate law enforcement authorities, both federal and state, so that they can pursue any appropriate criminal investigation perjury charges.

20. The tape is also crucial for [redacted] to dismiss the frivolous complaint filed by Jeffrey Epstein against her, as he clearly acknowledges knowing [redacted] contrary to claims he makes in his complaint against her and also contradictory to other statements he has made in depositions related to knowing [redacted] In that regard, this tape provides evidence of other false statements Epstein has made under oath.

21. During a telephone call with George Rush, he provided me more than a description of the tape, and in fact described the general tenor of the entire interview, so that nothing in the interview can be fairly regarded as confidential at this point.

22. As George Rush admitted in his affidavit, he played the tape for *at least* two other persons who also confirmed Epstein's arrogance as he speaks about his actions with minors.

23. The people for whom George Rush played the tape or told in detail of the information on the tape were not "sources" in the tradition sense of the word – all individuals were simply chatting with Mr. Rush about Mr. Epstein and his propensity to molest children. For example, when I discussed the tape with Mr. Rush, I was not a "source" in the traditional sense of that term. At no point did Mr. Rush tell me that I was a "source" for his reporting.

24. Because Epstein and all other co-conspirators have invoked the 5th amendment as to all relevant questions, this tape is the *only* way that Jane Doe can put Epstein's own perceptions of what he has done before the jury and the only way that Jane Doe can put Epstein's admissions and statement s before the jury. As even a quick perusal of the more than 500 entries on the docket sheet for Jane Doe's (consolidated) case will confirm (see Case no. 9:08-80119 (S.D. Fla.) (case number for consolidated cases on discovery), Jane Doe and other plaintiffs have made exhaustive attempts to obtain information from Epstein about his abuse. These attempts have included repeated requests for admission, requests for production, interrogatories, and depositions – all the means that are listed in the Federal Rules of Civil Procedure for obtaining discovery. These means have all been exhausted without success. Neither

Jane Doe nor any of the other plaintiffs have been able to obtain even a single word of information from Epstein about his abuse of minor girls.

25. I made a good faith, albeit unsuccessful, effort to resolve this matter with Anne B. Carroll, representing the Daily News in order to avoid any court intervention. I explained that we needed this tape for several reasons, including those cited by her in her pleading. The tape is detrimental to Epstein's personal complaint against [redacted] and me; the tape is evidence of perjury committed by Epstein; the tape is the Best Evidence of his lack of remorse for his actions and will be presented in the punitive damages phase of the civil trials against him; and, perhaps most important, the tape is the only way that the jury considering Jane Doe's case will be able to hear Epstein's voice and own statements about his abuse of Jane Doe and other minor girls. Without the tape, the jury will not have the opportunity to hear Epstein give any substantive information about Jane Doe's complaint. Indeed, they will not have the opportunity to even hear Epstein's voice utter any substantive words other than (in essence) "I take the Fifth." As part of our discussion, Ms. Carroll told me that it was a "stupid move" for Mr. Rush to play the tape or disclose the tape to other people as he likely waived any privilege and that, as a result of disclosing the tape, he was at risk of losing his job. I responded that it did not seem fair that Mr. Rush lose his job or be punished in any way, but that I had an absolute duty to represent my client and that I would be failing in that duty if I did not pursue this critical piece of evidence.

I declare under penalty of perjury that the foregoing is true and correct.

FURTHER AFFIANT SAYETH NAUGHT.

Dated this 23rd day of April, 2010.

Brad Edwards, Esq.

The foregoing instrument was acknowledged before me this 23rd day of April, 2010 by BRAD EDWARDS, who is personally known to me.

NOTARY PUBLIC

Print Name:_____

My Commission Expires:

MARIA W. KELLICHIAN
MY COMMISSION # DD 813393
EXPIRES: August 11, 2012
Bonded Thru Notary Public Underwriters

EXHIBIT N

AFFIDAVIT OF BRADLEY JAMES EDWARDS

1. I am an attorney in good standing with the Florida Bar and admitted to practice in the Southern District of Florida. I am currently a partner in the law firm of Farmer, Jaffe, Weissing, Edwards, Fistos & Lehrman, P.L.

2. In 2008, I was a sole practitioner running a personal injury law firm in Hollywood, FL. While a sole practitioner I was retained by three clients, [redacted], [redacted], and Jane Doe to pursue civil litigation against Jeffrey Epstein for sexually abusing them while they were minor girls. I agreed to represent these girls, along with attorney Jay Howell (an attorney in Jacksonville, Florida with Jay Howell & Associates) and Professor Paul Cassell (a law professor at the University of Utah College Of Law). I filed state court actions on behalf of L.M. and E.W. and a federal court action on behalf of Jane Doe. All of the cases were filed in the summer of 2008.

3. My clients received correspondence from the U.S. Department of Justice regarding their rights as victims of Epstein's federal sex offenses. (True and accurate copies of the letters are attached to Statement of Undisputed Facts as Exhibit "M")

4. In mid June 2008, I contacted Assistant United States Attorney Marie Villafaña to inform her that I represented Jane Doe #1 [redacted].) and, later, Jane Doe #2 ([redacted]). I asked to meet to provide information regarding Epstein. AUSA Villafaña did not advise me that a plea agreement had already been negotiated with Epstein's attorneys that would block federal prosecution. AUSA Villafaña did indicate that federal investigators had concrete evidence and information that Epstein had sexually molested at least 40 underage minor females, including [redacted]., Jane Doe and [redacted]

5. I also requested from the U.S. Attorney's Office the information and evidence that they had collected regarding Epstein's sexual abuse of his clients. However, the U.S. Attorney's Office declined to provide any such information to me. The U.S. Attorney's Office also declined to provide any such information to the other attorneys who represented victims of Epstein's sexual assaults.

6. I was informed that on Friday, June 27, 2008, at approximately 4:15 p.m., AUSA Villafaña received a copy of Epstein's proposed state plea agreement and learned that the plea was scheduled for 8:30 a.m., Monday, June 30, 2008. She called me to provide notice to my clients regarding the hearing. She did not tell me that the guilty pleas in state court would bring an end to the possibility of federal prosecution pursuant to the plea agreement. My clients did not learn and understand this fact until July 11, 2008, when the agreement was described during a hearing held before Judge Marra on the Crime Victims' Rights Act action that I had filed.

7. In the summer of 2008 I filed complaints against Jeffrey Epstein on behalf of [redacted], E.W., and Jane Doe.

8. In the Spring of 2009 (approximately April), I joined the law firm of Rothstein, Rosenfeldt and Adler, P.A. ("RRA"). I brought my existing clients with me when I joined RRA, including [redacted], and Jane Doe. When I joined the firm, I was not aware that Scott Rothstein was running a Ponzi scheme at RRA. Had I known such a Ponzi scheme was in place, I would never have joined RRA.

9. I am now aware that it has been alleged that Scott Rothstein made fraudulent presentations to investors about the lawsuits that I had filed on behalf of my clients against Epstein and that it has been alleged that these lawsuits were used to fraudulently lure investors into Rothstein's Ponzi scheme. I never met a single investor, had no part in any such presentations and had no knowledge any such fraud was occurring. If these allegations are true, I had no knowledge that any such fraudulent presentations were occurring and no knowledge of any such improper use of the case files.

10. Epstein's Complaint against me alleges that Rothstein made false statements about cases filed against Epstein, i.e., that RRA had 50 anonymous females who had filed suit against Epstein; that Rothstein sold an interest in personal injury lawsuits, reached agreements to share attorneys fees with non-lawyers, paid clients "up front" money; and that he used the judicial process to further his Ponzi scheme. If Rothstein did any of these things, I had no knowledge of his actions. Because I maintained close contact with my clients, [redacted] and Jane Doe, and Scott Rothstein never met any of them, I know for certain that none of my clients were paid "up front" money by anyone.

11. Epstein alleges that I attempted to take the depositions of his "high profile friends and acquaintances" for no legitimate litigation purpose. This is untrue, as all of my actions in representing [redacted]., [redacted], and Jane Doe were aimed at providing them effective representation in their civil suits. With regard to Epstein's friends, through documents and information obtained in discovery and other means of investigation, I learned that Epstein was sexually molesting minor girls on a daily basis and had been for many years. I also learned the unsurprising fact that he was molesting the girls in the privacy of his mansion in West Palm Beach, meaning that locating witnesses to corroborate their testimony would be difficult to find. I also learned, from the course of the litigation, that Epstein and his lawyers were constantly attacking the credibility of the girls, that Epstein's employees were all represented by lawyers who apparently were paid for (directly or indirectly) by Epstein, that co-conspirators whose representation was also apparently paid for by Epstein were all taking the Fifth (like Epstein) rather than provide information in discovery. For example, I was given reason to believe that [redacted], Larry Visoski, Larry Harrison, David Rogers, Louella Rabuyo, [redacted], Ghislaine Maxwell, Mark Epstein, and Janusz Banasiak all had lawyers paid for by Epstein. Because Epstein and the co-conspirators in his child molestation criminal enterprise blocked normal discovery avenues, I needed to search for other ordinary approaches to strengthen the cases of my clients. Consistent with my training and experience, these other ordinary approaches included finding other witnesses who could corroborate allegations of sexual abuse of my clients or other girls. Some of these witnesses were friends of Epstein. Given his social status, it also turned out that some of his friends were high-profile individuals.

12. In light of information I received suggesting that British socialite Ghislaine Maxwell, former girlfriend and long-time friend of Epstein's, was involved in managing Epstein's affairs and companies I had her served for deposition for August 17, 2009. (Deposition Notice attached to Statement of Undisputed Facts as Exhibit BB). Maxwell was represented by Brett Jaffe of the New York firm of Cohen and Gresser, and I understood that her attorney was paid for (directly or indirectly) by Epstein. She was reluctant to give her deposition, and I tried to work with her attorney to take her deposition on terms that would be acceptable to both sides. Her attorney and I negotiated a confidentiality agreement, under which Maxwell agreed to drop any objections to the deposition. Maxwell, however, still avoided the deposition. On June 29, 2010, one day before I was to fly to NY to take Maxwell's deposition, her attorney informed me that Maxwell's mother was deathly ill and Maxwell was consequently flying to England with no intention of returning and certainly would not return to the United States before the conclusion of Jane Doe's trial period (August 6, 2010). Despite that assertion, I later learned that Ghislaine Maxwell was in fact in the country on approximately July 31, 2010, as she attended the wedding of Chelsea Clinton (former President Clinton's daughter) and was captured in a photograph taken for US Weekly magazine.

13. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Donald Trump's deposition in the civil suits against him. Trump was properly noticed because: (a) after review of the message pads confiscated from Epstein's home, the legal and investigative team assisting my clients learned that Trump called Epstein's West Palm Beach mansion on several occasions during the time period most relevant to my clients' complaints; (b) Trump was quoted in a *Vanity Fair* article about Epstein as saying **"I've known Jeff for fifteen years. Terrific guy." "He's a lot of fun to be with. It is even said that he likes beautiful women as much as I do, and many of them are on the younger side. No doubt about it – Jeffrey enjoys his social life."** Jeffrey Epstein: International Moneyman of Mystery; **He's pals with a passel of Nobel Prize–winning scientists, CEOs like Leslie Wexner of the Limited, socialite Ghislaine Maxwell, even Donald Trump. But it wasn't until he flew Bill Clinton, Kevin Spacey, and Chris Tucker to Africa on his private Boeing 727 that the world began to wonder who he is. By Landon Thomas Jr.**; (c) I learned through a source that Trump banned Epstein from his Maralago Club in West Palm Beach because Epstein sexually assaulted an underage girl at the club; (d) Jane Doe No. 102's complaint alleged that Jane Doe 102 was initially approached at Trump's Maralago by Ghislaine Maxwell and recruited to be Maxwell and Epstein's underage sex slave; (e) Mark Epstein (Jeffrey Epstein's brother) testified that Trump flew on Jeffrey Epstein's plane with him (the same plane that Jane Doe 102 alleged was used to have sex with underage girls) deposition of Mark Epstein, September 21, 2009 at 48-50; (f) Trump visited Epstein at his home in Palm Beach – the same home where Epstein abused minor girls daily; (g) Epstein's phone directory from his computer contains 14 phone numbers for Donald Trump, including emergency numbers, car numbers, and numbers to Trump's security guard and houseman. Based on this information, I believed that

Trump might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

14. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Alan Dershowitz's deposition in the civil suits against him. Dershowitz was properly noticed because: (a) Dershowitz has been friends with Epstein for many years; (b) in one news article Dershowitz comments that, "I'm on my 20th book... The only person outside of my immediate family that I send drafts to is Jeffrey" The Talented Mr. Epstein, By Vicky Ward on January, 2005 in Published Work, Vanity Fair; (c) Epstein's housekeeper Alfredo Rodriguez testified that Dershowitz stayed at Epstein's house during the years most relevant to my clients; (d) Rodriguez testified that Dershowitz was at Epstein's house at times when underage females where there being molested by Epstein (see Alfredo Rodriguez deposition at 278-280, 385, 426-427); (e) Dershowitz was reportedly involved in persuading the Palm Beach State Attorney's office not to file felony criminal charges against Epstein because the underage females lacked credibility and thus could not be believed that they were at Epstein's house, despite him being an eyewitness that the underage girls were actually there; (f) Jane Doe No. 102 stated generally that Epstein forced her to be sexually exploited by not only Epstein but also Epstein's "adult male peers, including royalty, politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories that Dershowitz and acquaintances of Dershowitz fall into; (g) during the years 2002-2005 Alan Dershowitz was on Epstein's plane on several occasions according to the flight logs produced by Epstein's pilot and information (described above) suggested that sexual assaults may have taken place on the plane; (h) Epstein donated Harvard $30 Million dollars one year, and Harvard was one of the only institutions that did not return Epstein's donation after he was charged with sex offenses against children. Based on this information, I believed that Dershowitz might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

15. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Bill Clinton's deposition. Clinton was properly noticed because: (a) it was well known that Clinton was friends with Ghislaine Maxwell, and several witnesses had provided information that Maxwell helped to run Epstein's companies, kept images of naked underage children on her computer, helped to recruit underage children for Epstein, engaged in lesbian sex with underage females that she procured for Epstein, and photographed underage females in sexually explicit poses and kept child pornography on her computer; (b) newpaper articles stated that Clinton had an affair with Ghislaine Maxwell, who was thought to be second in charge of Epstein's child molestation ring. The Cleveland Leader newspaper, April 10, 2009; (c) it was national news when Clinton traveled with Epstein (and Maxwell) aboard Epstein's private plane to Africa and the news articles classified Clinton as Epstein's friend; (d) the flight logs for the relevant years 2002 - 2005 showed Clinton traveling on Epstein's plane on more than 10 occasions and his assistant, Doug Band, traveled on many more occasions; (e) Jane Doe No. 102 stated generally that she was required by Epstein to be sexually

exploited by not only Epstein but also Epstein's "adult male peers, including royalty, politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories Clinton and acquaintances of Clinton fall into; (f) flight logs showed that Clinton took many flights with Epstein, Ghislaine Maxwell, [redacted] and [redacted] -- all employees and/or co-conspirators of Epstein's that were closely connected to Epstein's child exploitation and sexual abuse; (g) Clinton frequently flew with Epstein aboard his plane, then suddenly stopped – raising the suspicion that the friendship abruptly ended, perhaps because of events related to Epstein's sexual abuse of children; (h) Epstein's personal phone directory from his computer contains e-mail addresses for Clinton along with 21 phone numbers for him, including those for his assistant (Doug Band), his schedulers, and what appear to be Clinton's personal numbers. Based on this information, I believed that Clinton might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

16. Epstein alleges that Tommy Mottola was improperly noticed with a deposition. I did not notice Mattola for deposition. He was noticed for deposition by a law firm representing another one of Epstein's victims – not by me.

17. Epstein alleges that there was something improper in the fact that I notified him that I intended to take the illusionist David Copperfield's deposition. Copperfield was properly noticed because: (a) Epstein's housekeeper Alfredo Rodriguez testified that David Copperfield was a guest on several occasions at Epstein's house; (b) according to the message pads confiscated from Epstein's house, Copperfield called Epstein quite frequently and left messages that indicated they socialized together; (c) Copperfield himself has had similar allegations made against him by women claiming he sexually abused them; (d) one of Epstein's sexual assault victims also alleged that Copperfield had touched her in an improper sexual way while she was at Epstein's house. Based on this information, I believed that Copperfield might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

18. Epstein alleges that there was something improper in the fact that I identified Bill Richardson as a possible witness against him in the civil cases. Richardson was properly identified as a possible witness because Epstein's personal pilot testified to Richardson joining Epstein at Epstein's New Mexico Ranch. See deposition of Larry Morrison, October 6, 2009, at 167-169. There was information indicating that Epstein had young girls at his ranch which, given the circumstances of the case, raised the reasonable inference he was sexually abusing these girls since he had regularly and frequently abused girls in West Palm Beach and elsewhere. Richardson had also returned campaign donations that were given to him by Epstein, indicating that he believed that there was something about Epstein that he did not want to be associated with. Richardson was not called to testify nor was he ever subpoenaed to testify.

19. Epstein alleges that discovery of plane and pilot logs was improper during discovery in the civil cases against him. Discovery of these subjects was clearly proper <u>and</u>

necessary because: (a) Jane Doe filed a federal RICO claim against Epstein that was an active claim through much of the litigation. The RICO claim alleged that Epstein ran an expansive criminal enterprise that involved and depended upon his plane travel. Although Judge Marra dismissed the RICO claim at some point in the federal litigation, the legal team representing my clients intended to pursue an appeal of that dismissal. Moreover, all of the subjects mentioned in the RICO claim remained relevant to other aspects of Jane Doe's claims against Epstein, including in particular her claim for punitive damages; (b) Jane Doe also filed and was proceeding to trial on a federal claim under 18 U.S.C. § 2255. Section 2255 is a federal statute which (unlike other state statutes) guaranteed a minimum level of recovery for Jane Doe. Proceeding under the statute, however, required a "federal nexus" to the sexual assaults. Jane Doe had two grounds on which to argue that such a nexus existed to her abuse by Epstein: first, his use of the telephone to arrange for girls to be abused; and, second, his travel on planes in interstate commerce. During the course of the litigation, I anticipated that Epstein would argue that Jane Doe's proof of the federal nexus was inadequate. These fears were realized when Epstein filed a summary judgment motion raising this argument. In respo-nse, the other attorneys and I representing Jane Doe used the flight log evidence to respond to Epstein's summary judgment motion, explaining that the flight logs demonstrated that Epstein had traveled in interstate commerce for the purpose of facilitating his sexual assaults. Because Epstein chose to settle the case before trial, Judge Marra did not rule on the summary judgment motion. (c) Jane Doe No. 102's complaint outlined Epstein's daily sexual exploitation and abuse of underage minors as young as 12 years old and alleged that he used his plane to transport underage females to be sexually abused by him and his friends. The flight logs accordingly might have information about either additional girls who were victims of Epstein's abuse or friends of Epstein who may have witnessed or even participated in the abuse. Based on this information, I believed that the flight logs and related information was relevant information to prove the cases against Jeffrey Epstein and accordingly I pursued them in discovery.

20. In approximately November 2009, the existence of Scott Rothstein's Ponzi scheme became public knowledge. It was at that time that I, along with many other reputable attorneys at RRA, first became aware of Rothstein criminal scheme. At that time, I left RRA with several other RRA attorneys to form the law firm of Farmer Jaffe Weissing Edwards Fistos and Lehrman ("Farmer Jaffe"). I was thus with RRA for less than one year.

21. In July 2010, along with other attorneys at Farmer Jaffe and Professor Cassell, I reached favorable settlement terms for my three clients [redacted]., [redacted]., and Jane Doe in their lawsuits against Epstein.

22. On July 20, 2010, I received a letter from the U.S. Attorney's Office for the Southern District of Florida – the office responsible for prosecuting Rothstein's Ponzi scheme. The letter indicated that law enforcement agencies had determined that I was "a victim (or potential victim)" of Scott Rothstein's federal crimes. The letter informed me of my rights as a victim of Rothstein's federal crimes and promised to keep me informed about

subsequent developments in his prosecution. A copy of this letter is attached to this Affidavit. (A copy of the letter is attached to Statement of Undisputed Facts as Exhibit UU)

23. Jeffrey Epstein also filed a complaint with the Florida Bar against me. His complaint alleged that I had been involved in Rothstein's scheme and had thereby violated various rules of professional responsibility. The Florida Bar investigated and dismissed the complaint.

24. I have reviewed the Statement of Undisputed Facts filed contemporaneously with this Affidavit. Each of the assertions concerning what I learned, what I did, and the good faith beliefs formed by me in the course of my prosecutions of claims against Jeffrey Epstein as contained in the Statement of Undisputed Facts is true, and the foundations set out as support for my beliefs are true and correct to the best of my knowledge.

25. All actions taken by me in the course of my prosecution of claims against Jeffrey Epstein were based upon a good faith belief that they were reasonable, necessary, and ethically proper to fulfill my obligation to zealously represent the interests of my clients.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: 9/21, 2010

Bradley J. Edwards, Esq.

EXHIBIT A

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CASE NO.: 08-CIV-80893-MARRA/JOHNSON

JANE DOE,

Plaintiff,

vs.

JEFFREY EPSTEIN,

Defendant.
_____/

DEFENDANT EPSTEIN'S MOTION FOR SETTLEMENT CONFERENCE, OR IN THE ALTERNATIVE, MOTION TO DIRECT PARTIES' BACK TO MEDIATION

Defendant, JEFFREY EPSTEIN, by and through his undersigned attorneys, pursuant to the Federal Rules of Civil Procedure and the Local Rules for the Southern District of Florida, moves this Court for an order requiring the parties to attend a Settlement Conference before Magistrate Judge Linnea R. Johnson, or in the alternative, for an Order directing the parties to reconvene at a second mediation on or before July 1, 2010, and as grounds set forth would state:

1. The above-styled matter is currently scheduled on the Court's trial docket beginning July 19, 2010. (D.E. #119, Order Re-Setting Trial Date and Pretrial Deadlines). The Court's Mandatory Pretrial Stipulation and Motions in Limine deadlines are set for July 1, 2010. In this regard, if the parties could reach an agreement at a settlement conference or a mediation before these pre-trial deadlines, it would result in substantial conservation of judicial resources and preparation time.

2. The parties attended mediation on April 5, 2010, at Matrix Mediation, LLC, with Rodney Romano serving as mediator, but were unable to reach an agreement. (See D.E. #139).

3. Since the April 5, 2010 mediation, additional discovery has been completed and exchanged, including each parties' psychological (Plaintiff) and psychiatric (Defendant) expert depositions. As well, Defendant filed his Motion for Summary Judgment and Motion for Bifurcation. Both parties have exchanged witness and exhibit lists. Each party will be filing extensive Motions in Limine. Plaintiff's Trial Witness List has identified over 170 potential witnesses, and further, Plaintiff identifies over 140 trial exhibits, including composite exhibits that are hundreds of pages in length. It is conceivable this case could last 12- 20 trial days.

4. Additionally, since the parties attended mediation on April 5, 2010, Defendant has resolved all pending lawsuits, including Plaintiff, C.L. (Case No.: 10-80447) and JANE DOES Nos. 2-8 (Case Nos.: 08-80119, 08-80232, 08-08380, 08-80381, 08-80994, 08-80993, 08-80802), C.M.A. (Case No.08-80811), Jane Does Nos. 101, 102 and 103 (Case Nos. 09-80591, 09-80656, 10-80309), another Jane Doe (Case No. 08-80804), Jane Doe II (Case No. 09-80469), as well as other non-filed claims. Furthermore, Defendant has also resolved three state court claims. The only cases not resolved are this case and two (2) cases in state court (all three Plaintiffs are represented by Plaintiff's counsel, Brad Edwards, Esq. and his firm). [1]

5. Plaintiffs in other filed cases were represented by various law firms as the court is aware.

6. With the additional discovery completed to date and with the motions, trial preparation and judicial rulings necessary to try this case, all yet to be done, Defendant

[1] There is also a case styled L.M. v. Jeffrey Epstein, CASE NO.: 09-CIV-81092 – MARRA/JOHNSON, which was never served on the Defendant. Defendant has filed a Motion to Dismiss.

believes that a settlement conference or mediation is in the best interest of both parties to attempt resolution. There is no prejudice to either party.

7. Therefore, Defendant requests the Court issue an order directing the parties to attend a Settlement Conference before Magistrate Judge Johnson or that the Court direct the parties to attend a further mediation before July 1, 2010. Both Magistrate Judge Johnson and Rodney Romano (as the mediator in this case) are very familiar with the particular case and other claims that were asserted.

8. Defendant's Counsel has spoken with the secretary for the mediator, Rodney Romano, and she believes that he would be able to schedule a 2-3 hour mediation on short notice this week.

WHEREFORE, Defendant, JEFFREY EPSTEIN respectfully requests the Court to enter an Order directing the parties to attend a Settlement Conference before Magistrate Judge Linnea R. Johnson, or in the alternative, a mediation on or before July 1, 2010.

Rule 7.1 Certification

I hereby certify that counsel has communicated by telephone with Plaintiff's counsel in a good faith effort to resolve the issues set forth herein. Plaintiff's position is that the parties have already complied with the mediation requirements.

By: s/Robert D. Critton, Jr.
Robert D. Critton, Jr.
Michael J. Pike
Attorneys for Defendant Epstein

Certificate of Service

I HEREBY CERTIFY that a true copy of the foregoing was electronically filed with the Clerk of the Court using CM/ECF. I also certify that the foregoing document is being served this day on all counsel of record identified on the following service list in the manner specified via transmission of Notices of Electronic Filing generated by CM/ECF on this 28th day of June, 2010:

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Respectfully submitted,

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IN THE CIRCUIT COURT OF THE
FIFTEENTH JUDICIAL CIRCUIT IN
AND FOR PALM BEACH COUNTY, FLORIDA
GENERAL JURISDICTION DIVISION

JEFFREY EPSTEIN,
Plaintiff,
vs. No. 502009CA040800XXXXMBAG
SCOTT ROTHSTEIN, individually,
and BRADLEY J. EDWARDS,
individually,
Defendants.
_____/

500 East Broward Boulevard,
Ft. Lauderdale, Florida
Thursday, June 14, 2012
9:14 a.m. - 12:37 p.m.

D E P O S I T I O N
Of
SCOTT ROTHSTEIN
(Via Video Conference)

Taken on behalf of the Trustee
pursuant to a notice of taking deposition

- - -

IN THE CIRCUIT COURT OF THE FIFTEENTH JUDICIAL CIRCUIT IN AND FOR PALM BEACH COUNTY, FLORIDA
CASE NO. 50 2009CA040800XXXXMB AG
Complex Litigation, Fla.R.Civ.Pro. 1201

JEFFREY EPSTEIN,
Plaintiff,
-vs- VOLUME I OF II

SCOTT ROTHSTEIN, individually,
BRADLEY J. EDWARDS,
individually, and L.M. individually,

Defendants.

VIDEOTAPED DEPOSITION OF BRADLEY J. EDWARDS, ESQUIRE

Tuesday, March 23, 20010
10:00 - 5:07 p.m.

2139 Palm Beach Lakes, Boulevard
West Palm Beach, Florida 33401

Reported By:
Cynthia Hopkins, RPR, FPR
Notary Public, State of Florida
Prose Court Reporting
Job No.: 1333

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ALSO PRESENT:
Jeffrey Epstein
Joseph Kozak, Videographer
Prose Reporting Services

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PROCEEDINGS

Deposition taken before Cynthia Hopkins, Registered Professional Reporter and Florida Professional Reporter, and Notary Public in and for the State of Florida at Large, in the above cause.

THE VIDEOGRAPHER: We are now on video record. This is Media Number One in the videotaped deposition of Bradley Edwards in the matter of Jeffrey Epstein versus Scott Rothstein, Bradley J. Edwards, and L.M.

Today is Tuesday, March 23rd, 2010 at 10:00 a.m. We're here in the law offices of Searcy, Denney, Scarola, Barnhart & Shipley, 2139 Palm Beach Lakes Boulevard, West Palm Beach, Florida.

My name is Joe Kozak. I am the videographer. The court reporter is Cindy Hopkins from Prose, Prose Court Reporting Agency.

Will counsel please introduce yourselves, and then the court reporter will swear in the witnesses.

MR. CRITTON: Bob Critton on behalf of the

1078

From: Steven Victor MD [redacted]
Sent: 11/23/2012 1:06:38 PM
To: [redacted]
CC: [redacted]
Subject: Report on Stem Cells future

PUBLISHED: 22 NOVEMBER 2012

The view from the US: Stem cell therapy steps up a gear with first approval and improved political climate

Special Report

Peter Winter

Positive clinical data, increases in federal funding and the first regulatory approval of a manufactured stem cell product mean momentum is building in the US. With the re-election of President Obama, this is likely to continue

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Image: Bigstock

When US President Barack Obama came into office he made good on his promise to overturn President George W. Bush's executive order that - with the exception of a handful of existing stem cell lines - prohibited federal funding of human embryonic stem cell (hESC) research.

Special Report - Stem Cell Research under Horizon 2020

Stem Cell Research in Horizon 2020: Experts debate what Europe must do to maintain its lead in regenerative medicine
The view from the US: Stem cell therapy steps up a gear with first approval and improved political climate
View from Europe: Delivering on the vision of regenerative medicine and stem cells
Talking to the experts: Why the EU should support human embryonic stem cell research in Horizon 2020
OVERVIEW: Regenerate the future - human embryonic stem cell research is crucial to deliver health and growth

This easing of restrictions on hESC research was expected to engender enough confidence to attract investors into the space and encourage pharmaceutical and biotech companies to build robust product pipelines based on stem cell therapies. However, a tougher regulatory climate for biopharmaceuticals in general and a protracted legal challenge to the relaxing of rules on hESCs has served to keep both big pharma companies and venture capitalists on the sidelines to date.

Nevertheless, there has been progress, particularly at the research end of the development spectrum. Three and a half years on stem cells are no longer high on the political agenda as they once were. This speaks to the generally positive public acceptance of stem cell research in the US. A Research!America poll of likely voters in the presidential election, conducted in August 2012, found that 61 per cent of prospective voters were in favor of expanding funding for hESC research.

Investor interest

Looking back over his first term in office Obama can point to some major gains. These include funding increases for the National Institutes of Health's (NIH) stem cell initiatives, and greater investor interest in the wider field of regenerative medicine including the use of adult stem cells and induced pluripotent stem (iPS) cells.

However, it hasn't all been smooth sailing. Although after protracted forethought, the US Food and Drug Administration (FDA) gave the green light for the Californian biotech Geron to begin the very first human clinical trial of a human embryonic stem cell-derived therapy in January 2009, the trial has not been without its problems.

The Phase I trial, treating patients with acute spinal cord injury, was hit with an FDA clinical hold causing significant delays to its initiation in 2010. A year later, after 15 years' effort, the Geron washed its hands of the programme, blaming its withdrawal from the stem cell space on capital scarcity and uncertain economic conditions. The decision wiped out a leading player in hESC translation and commercialisation. However, the regenerative medicine sector has been able to recover and is beginning to blossom. (See Public Markets section below). The prime movers in the Geron trial are now attempting to revive it.

Research funding robust

Federal funding for all forms of stem cell research has increased over the past four years. However, the NIH funding component for hESC has been dogged by litigation for the past three years. In Sherley v. Sebelius, researchers James Sherley and Theresa Deisher, who worked with adult stem cells, claimed the NIH guidelines violated the Dickey-Wicker Amendment, which prohibits the use of federal funds for research in which human embryos are destroyed or discarded. This overhang was not finally removed until August 2012 when a three-judge panel from the US Court of Appeals for the District of Columbia Circuit unanimously upheld the NIH 2009 guidelines that permit funding of hESC research.

Through its Common Fund the NIH has established the Center for Regenerative Medicine (NIH CRM), to support this field, with the goal of accelerating the translation of stem cell-based clinical therapies.

State funding filling the void

With stem cell research in general not attracting a significant amount of venture funding, the California Institute of Regenerative Medicine (CIRM), which was established in 2004 with $3 billion for stem cell research at California universities and research institutions, has begun to fill the void left by traditional venture capital firms. To date CIRM has allocated $150 million in funding to help move promising stem cell-based therapies from the bench into clinical trials.

"We are a lot closer to having promising therapies ready for clinical trials, so it makes sense that we step up our engagement with industry to help fund those trials and move those therapies closer to approval by the FDA," said Duane Roth, vice chair of the governing board of CIRM.

CIRM's funding for translational research is good news for biotech companies, providing them with a source of funds in a field where it remains challenging to raise private capital.

Three biotech companies have been funded so far under CIRM's Strategic Partnership Awards initiative. A grant of $10.1 million was awarded to ViaCyte Inc. to continue preclinical research and initiate clinical testing of an embryonic stem cell-based therapy for patients with insulin-dependent diabetes.

Meanwhile, Bluebird Bio Inc. will use a $9.3 million grant to support a Phase I/II study to evaluate the safety and efficacy of LentiGlobin, the company's programme for the treatment of the inherited blood disorder beta-thalassemia, which will be initiated in the US in 2013.

StemCells Inc. has been awarded up to $20 million to fund preclinical development of its product consisting of purified human neural stem cells for treating Alzheimer's disease, with the goal of filing for permission to carry out a clinical trial in that time. In July, CIRM approved a separate award to the company for up to $20 million to fund preclinical development of a cell therapy for spinal cord injury.

Public Markets

It has been a good year for stem cell companies on the public markets, with the thirteen publicly-listed stem cell companies showing an average increase in share price of 11.6 percent in the year-to-date.

This boost came from a regulatory approval and positive clinical trials results. It was a big breakthrough for the field as a whole when the Canadian regulator Health Canada approved Prochymal, Osiris Therapeutics Inc.'s allogeneic stem cell treatment for graft-vs.-host disease (GvHD) in children.

The decision marked the world's first regulatory approval of a manufactured stem cell product and the first therapy approved for GvHD – a devastating complication of bone marrow transplantation that kills up to 80 percent of children affected, many within just weeks of diagnosis. The company's stock value has almost doubled in the course of this year.

Meanwhile, Newark, California-based StemCells, Inc. has seen its shares rise 148 per cent in the year to date. In addition to its CIRM grants, the company recently reported clinical and preclinical data demonstrating the therapeutic potential of a cell therapy for treating myelination disorders.

Pluristem Therapeutics Inc.'s stock value also has jumped 44 per cent, on the strength of reporting a single case study in which a patient with aplastic bone marrow who received an intramuscular injection of its PLacental eXpanded cells under compassionate use saw an improvement. The company was also able to successfully complete a public offering which netted about US$30 million.

Positive clinical trials will begin to encourage investment

While still in their early stages of development - and with clinical trials having only involved a limited number of patients - reports to date have been very promising, and provide further validation for encouraging investment in stem cell therapeutics. For example, data from a human embryonic stem cell trial conducted by Advanced Cell Technology and published in medical journal The Lancet, showed that two patients with Stargardt's disease, a degenerative eye condition, had regained some vision.

In addition, positive early data from a spinal cord injury trial involving StemCells' neural stem cells indicated that two patients with no feeling below the site of injury were able to regain sensation, while in another study from the company, patients with a rare myelination disorder were able to create myelin, an advance that holds promise for treating multiple sclerosis and cerebral palsy.

This scientific progress has helped breath a new sense of optimism into the US stem cell sector. The Fiscal Cliff apart, it seems likely this momentum will continue now Obama has secured a second term.

Peter Winter is a writer, editor and analyst on the global biotechnology industry. He is currently editor of BioWorld Insight.

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From: Ian Osborne [redacted]
Sent: 11/28/2012 5:55:14 PM
To: Jeffrey Epstein [jeevacation@gmail.com]
Subject: Fwd: Invite to Dialog 2014 (16 months away)

Importance: High

Same shit. Peter doesn't even attend. I will tell him that he should stop them using his name.

Begin forwarded message:

From: "Auren Hoffman" <[redacted]>
Subject: **Invite to Dialog 2014 (16 months away)**
Date: 28 November 2012 16:05:59 GMT
To: [redacted]>

Dear Ian –

You are invited to join us at Dialog 2014 -- a two-day bipartisan retreat discussing how to change the world.

You were nominated for Dialog by Chamath Palihapitiya.

There will be no speeches … just many moderated break-out discussions of 6-15 people on various topics. And we design the agenda around your ideas and needs.

Please let us know if you would like to join us,

- Peter Thiel and Auren Hoffman

p.s. and yes, we know Dialog 2014 is 16 months away, but we are giving you a chance to sign up now

DETAILS:

You're invited to join us at the Dialog Retreat ... 150 people to change the world ... a participatory and entrepreneurial conversation on changing the world.

The **Dialog** participants aren't modest. We want to change the world.
But we don't want to spend our time being in a large audience listening to winded speeches. There are no speakers. No panels. All attendees participate in break-out facilitated discussions. And we **limit the discussion to only 150 global leaders** who can have an impact now and emerging leaders who can help implement the plans we develop.

Dates: March 13-15, 2014
Location: Sundance Resort, Utah (40 minutes from the Salt Lake City airport)
We've rented out the entire resort

Register at:
http://dialog2014.eventbrite.com
password: dialog2014
You qualify for a significant discount on the retreat fee. On the registration page, click on the link that says 'Enter promotional code' and enter:
GovtEmployee

note: the invite is only for Ian Osborne and is not transferable as we are limited to only 150 participants. There are no sponsors. We increase the retreat fee weekly to reward the people that sign up early. And this retreat is 100% off-the-record.

We hope you can join us.

Dialog participants…

… partial list of people who will be participating in the 2013 Dialog Retreat (all are references):

Veronica Allende Serra – Founding Partner, Pacific Investments. Chm, Portal de Documentos. Boards: Allied Advanced Technologies, Wow! Nutrition, Mercado Libre, ISmart Foundation.

Susan Athey -- Professor of Economics, Harvard University. Chief Economist, Microsoft. 2007 Winner of John Bates. Clark Medal.

Byron Auguste -- Director and Head of Social Sector Office, McKinsey & Co. Chm, Hope Street Group. Boards: William and Flora Hewlett Foundation; Pacific Council on International Policy; Center for American Progress.

David Barron – Professor, Harvard Law School. Fmr Acting Asst U.S. Attorney General in the Office of Legal Counsel.

Kirsten Bartok -- CEO, AirFinance. Fmr CFO of XOJet. Fmr GP at Alpine Investors.

Evan Bayh – Sr Advisor, Apollo Management. Partner, McGuireWoods. Fmr U.S. Senator (D-IN) (1999-2011). Fmr Governor of Indiana (1989-1997). Author, *From Father to Son*.

Tom Bedecarre – CEO, AKQA.

Nick Beim – GP, Matrix. Boards: Gilt Groupe, TheLadders, Care.com, Conductor, Intent Media, BuyWithMe.

Nicolas Berggruen -- President, Berggruen Holdings.

Charles Best – CEO, DononrsChoose.

Elizabeth Blackburn – Prof of Biology and Physiology, UCSF. 2009 Winner of Nobel Prize in Medicine. President, American Association of Cancer Research.

David Bonderman – Founding Partner, Texas Pacific Group (TPG). Founding Partner, Newbridge Capital. Boards: Continental Airlines, Bowe Bell & Howell, Ducati Motorcycles, Credicom Asia, National Education Corp, Beringer Wine, Carr Reality, Virgin Cinemas, CoStar Group, GemAlto, RyanAir Holdings, Wilderness Society, World Wildlife Fund.

Jason Bordoff – Senior Advisor for Energy and Environmental Policy to U.S. President Obama.

Erik Brynjolfsson – Prof of Economics, MIT Sloan School of Management. Director, MIT Center for Digital Business. Chair, *MIT Sloan Management Review.* Author, *Race Against the Machine*.

John Burbank – CEO, Passport Capital.

John Burbank – President, Nielsen Strategic Initiatives. Fmr CEO of Online, Nielsen. Fmr CMO, Nielsen. Fmr CMO, AOL.

Leah Busque – Founder, TaskRabbit.

Marc Cenedella – CEO, TheLadders.

Stephen Cohen – cofounder, Palantir.

Gio Colella – CEO, Castlight Health. Fmr CEO, RelayHealth.

Mark Colodny – Managing Director, Warburg Pincus. Boards: CAMP Systems, GlobalSpec, MLM Information, iParadigms, MultiView, A Place for Mom, EVIDON, eCert, Spigit, OnTargetJobs.

Boykin Curry -- Managing Director, Eagle Capital. Creator of Playa Grande. Cofndr, Girls Prep. Boards: Alliance for School Choice, Democrats for Education Reform.

Adam D'Angelo – CEO, Quora. Fmr CTO, Facebook.

Mitch Daniels – President, Purdue University. Governor, State of Indiana (2005-2013). Fmr Director, Office of Management and Budget (2001-2003).

Lanny Davis -- Fmr Special Counsel to the President (under Clinton). Author of Scandal and The Emerging Democratic Majority.

Ken Denman – CEO, Machine Perception Technologies. Fmr CEO of Openwave. Fmr CEO of iPass (IPAS). Fmr CEO, AuraServ Communications. Fmr SVP MediaOne. National Markets.

Marc Ecko – Chief Creative Officer, Marc Ecko Enterprises. Award-winning artist.

RP Eddy – CEO, Ergo. Fmr Director, White House National Security Council. Fmr Chief of Staff to U.N. Ambassador Richard Holbrooke. Sr Fellow, Manhattan Institute.

Juan Enriquez – CEO, Biotechonomy. Founding Director of the Life Sciences Project, Harvard Business School. Boards: Cabot Corp, Craig Venter Institute. Fmr CEO, Mexico City 's Urban Development Corporation.

Jeff Epstein – fmr CFO, Oracle. Fmr CFO, DoubleClick. Fmr CFO, King World Productions. Boards: Priceline.com, Stanford University Hospital.

Niall Ferguson – Prof History, Harvard. Author of *The World's Banker: The History of the House of Rothschild, The Cash Nexus, Empire, Colossus, The War of the World, The Ascent of Money*, and others.

Brad Garlinghouse – CEO, YouSendIt.

Julius Genachowski – Chairman, Federal Communications Commission (FCC).

Jared Genser – MD, Persesus Strategies. Founder, Freedom Now. International lawyer for Aung San Suu Kyi.

Jeff George – Global Head, Sandoz. Member of Exec Committee, Novartis.

Dave Goldberg – CEO, SurveyMonkey.

Tom Goldstein -- Partner, Goldstein & Howe. Fmr Partner and head of Supreme Court practice, Akin Gump. Has argued over 20 cases before Supreme Court. CEO, SCOTUSblog.

Fabrice Grinda -- CEO, OLX. Fmr fndr and CEO, Zingy. Fmr CEO, Aucland.

Ash Gupta – Chief Risk Officer, American Express.

Richard Haass – President, Council on Foreign Relations. Fmr Director of Policy Planning, U.S. State Department. Fmr U.S. Special Envoy to Northern Ireland.

Victor Halberstadt – Prof of Economics, Leiden University (Netherlands). Fmr President, International Institute of Public Finance. Mbr, Investment Committee, ABP Pension Fund. Boards: RHJ Internationall.

Janet Hanson – CEO, 85Broads.

Hollie Moore Haynes – MD, Silver Lake Partners.

Bob Hertzberg -- Chairman, G24 Innovations. Partner, Mayer Brown Rowe & Maw. Fmr Speaker, California State Assembly (2000-2002). Fmr Regent, University of California. Fmr Chm, Mayor Antonio Villaraigosa transition team. Board: Solar Integrated Technologies (Chm), California Historical Society, MALDEF, Town Hall Los Angeles, Century Housing.

Jim Himes – U.S. Congressman (D-CT).

Auren Hoffman -- CEO of LiveRamp. Chm, Rapleaf. Curator, Dialog Retreat. Board: Retargeter.

Reid Hoffman – Chairman and founder, LinkedIn. Partner, Greylock. Boards: DoSomething, Kiva, Endeavor Global, Mozilla. Zynga.

Jacob Hsu – CEO, Symbio.

Daisuke Iwase – cofounder and COO, Lifenet Insurance (top life insurance company in Japan).

Christian Johansson – Secretary of Department of Business and Economic Development (DBED), State of Maryland. Fmr CEO, Economic Alliance of Greater Baltimore.

David Kamenetzky – Group Head, Mars & Co.

PV Kannan – CEO, 24/7 Customer.

Andy Karsner – CEO, Manifest Energy. Fmr U.S. Asst Sec of Energy for Energy Efficiency and Renewable Energy (2005-2009). Fmr Managing Director, Enercorp. Boards: Applied Materials, Conservation International.

Garry Kasporov – Fmr World Chess Champion. Chm, United Civil Front of Russia.

Neal Katyal – Partner, Hogan Lovells. Fmr Acting Solicitor General for the United States (2010-2011). Professor of Law, Georgetown U. Lead counsel for the plaintiff in Supreme Court case Hamdan vs. Rumsfeld.

Terry Kawaja – CEO, Luma Partners.

Juliette Kayyem – Foreign Affairs Columnist, Boston Globe. Lecturer in Public Policy, Harvard. Asst Sec. for Intergovernmental Affairs, U.S. Dept. of Homeland Security.

Jeff Kearl – Chm, SkullCandy.

Peter Kellner -- MD, Richmond Management. Cofounder, Endeavor. Fmr partner, Vectis Group.

Chris Kelly -- Fmr Chief Privacy Officer and Head of Global Public Policy at Facebook . Fmr Chief Privacy Office, Excite@Home.

Pradeep Khosla – Chancellor, UC San Diego. Fmr Dean of College of Engineering, Carnegie Mellon. Boards: Quantpoint, BioMatricore, BitArmor, Children's Institute, IIT Foundation, Mellon-Pitt Corp.

Charlie Kim – CEO, NextJump.

David Kirkpatrick – Author, *The Facebook Effect*. Fmr head technology writer, FORTUNE.

Henry Kravis – Co-CEO of KKR. Chm, First Data. Boards: Claremont McKenna College, Metropolitan Museum of Art, Mount Sinai Medical Center, Council on Foreign Relations, Columbia Business School, Rockefeller University, others. Fmr Chair, Partnership for New York City.

Marie-Josee Kravis – Boards: Publicis, LVMH. Boards: Memorial Sloan-Kettering Cancer Center, Robin Hood Foundation, Council on Foreign Relations, Qatar Museum Authority. President, Museum of Modern Art board of directors. Fmr Board: Ford, IAC, CIBC.

Will Lansing – CEO, FICO (NYSE: FICO). Fmr CEO, InfoSpace. Fmr CEO, NBC Internet. Fmr COO, Prodigy Communications.

Renaud Laplanche – CEO, Lending Club.

Laura and Gary Lauder -- General Partners, Lauder Partners. Cofndrs, Socrates Society.

Jenna Lee – Anchor, Fox News. Host, *Happening Now* on Fox News.

Jorge Lemann – Fmr Owner, AmBev (largest brewery in Latin America) and now one of the largest shareholders in Anheuser-Busch InBev. Boards: Lojas Americanas, Gillette, Swiss Re, Burger King.

Max Levchin – fmr CEO, Slide. Fmr co-founder, PayPal.

Jonathan Levin – Prof and Chair of Dept of Economics, Stanford. 2011 Winner of the John Bates Clark Medal.

Ann Lewis – President, NoLimits. Fmr Director of Communications to the U.S. President (1997-2000).

Rob LoCasio – CEO, LivePerson (NASDAQ: LSPN).

Jeremy Liew – GP, LightSpeed Venture Partners. Investor in: Bonobos, CarDomain, Flixster, Focus, Kixeye, Kongregate, LivingSocial, Playdom, RockYou, ShoeDazzle, and others.

Joe Lonsdale – CEO, Adepar. cofounder, Palantir.

Doreen Lorenzo – President, Frog Design.

Bob Luskin -- Partner and Co-Chair of Litigation Dept, Patton Boggs. Attorney to Karl Rove and Lance Armstrong. Fmr Chief Counsel to the Organized Crime & Racketeering Section of DOJ .

Jorn Lyseggen – CEO of Meltwater.

John Maeda – President, Rhode Island School of Design. Author, *Laws of Simplicity.*

Divesh Makan – CEO, Iconiq Capital.

Meyer Malka – co-CEO, Lemon.

Andy McAfee – Principal Research Scientist at the Center for Digital Business, MIT. Author of *Race Against the Machine.*

General Stan McChrystal – Ret. 4-star U.S. General. Led all U.S. forces in Afghanistan. Fmr Commander, Joint Special Operations Command. Current Principal, McChrystal Group. Sr. Fellow, Yale's Jackson Institute for Global Affairs.

Andrew McLaughlin – Fmr VP, Tumblr. Fmr Deputy CTO of the United States, White House. Fmr Dir of Public Policy, Google. Boards: Public Knowledge, Code for America.

Dmitri Mehlhorn – COO, StudentsFirst.

Lenny Mendonca -- Director, McKinsey. Head of McKinsey's strategy practice. Chm, McKinsey Global Institute. Chm, Bay Area Council. Board: McKinsey & Co, Economic Institute of the Bay Area, Bay Area Science and Innovation Consortium, The New America Foundation, Common Cause, Committee for Economic Development, ChildrenNow, and DonorsChoose.

Eugene Meyer – President, Federalist Society.

Chris Michel – GP, Nautilus Ventures. Award-winning photographer. Fmr CEO, Affinity Labs. Fmr CEO, Military.com. Boards: International Data Group, Dale Carnegie, Kixeye, Castlight Health, USO, Marine Corps University Foundation.

Katie Mitic – Fmr Head of Platform Marketing, Facebook. Fmr SVP, Palm. Fmr VP Product Strategy, Yahoo! Fmr Fndr and CEO, Four11. Boards: eBay, Special Olympics International.

Wes Moore -- Author, "The Other Wes Moore". Fmr. Special Assistant to Secretary of State Rice. Fmr Director of Information Operations, 82nd Airborne Division, US Army, Afghanistan 2005-2006.

Nader Mousavizadeh – CEO of Oxford Analytica.

Luke Muehlhauser – Exec Director, Singularity University.

Matt Mullenweg – Founder, Wordpress.

Roger Myerson -- Prof of Economics, U of Chicago. 2007 winner of Nobel Prize in Economics.

Scott Nathan – Partner, Baupost Group.

Meghan O'Sullivan -- Professor, Harvard Kennedy School of Govt. Fmr Deputy National Security Advisor for Iraq and Afghanistan, President George W. Bush. Mbr, Trilateral Commission.

Chamath Palihapitiya – CEO, Social+Capital. fmr VP Growth, Mobile, and International at Facebook. Fmr GM of AIM at AOL. Boards: SecondMarket, FixYa, Lemon, Integrated Plasmonics. Co-Owner, Golden State Warriors.

Eli Pariser – Fmr President, MoveOn. Cofndr, Avaaz.org. Boards: MoveOn, Avaaz, New Organizing Institute and Simon's Rock College.

Mark Penn – Corp VP of Strategic Projects (reports to the CEO), Microsoft. Fmr CEO, Burson-Marsteller. President, of polling firm Penn, Schoen and Berland Associates. Fmr Chief Strategist, Hillary Clinton for President 2008. Author, Microtrends. Fmr pollster to President Clinton. Fmr pollster to Prime Minister Tony Blair.

Lois Quam – Executive Director, Global Health Initiative – part of the State Department and she reports directly to Secretary Clinton. Fmr CEO of Public and Senior Markets, UnitedHealth Group ($30 billion division).

Dan Rosensweig – CEO, Chegg. Fmr CEO, Guitar Hero. Fmr COO, Yahoo.

Robert Rubin – Co-Chairman, Council on Foreign Relations. Fmr U.S. Secretary of the Treasury (1995-1999). Fmr Director, National Economic Council (1993-1995). Chm, Local Initiatives Support Corporation (LISC). Fmr Co-Chairman, Goldman Sachs.

Sal Russo – Founder, Tea Party Express. Partner, Russo Marsh.

Tod Sacerdoti – CEO, BrightRoll. Board: ReTargeter.

Amy Salzhauer – CEO, Ignition.

Cami Samuels – General Partner, Versant Ventures. Boards: Achaogen, APT Pharmaceuticals, Kythera Biopharmaceuticals, Semprae Laboratories.

Ken Sawyer -- CEO, Saints Ventures (manages over $1 billion in capital). Selected to Forbes Midas List. Boards: Continuous Computing, HK Systems, Cleargauge, Travel Intelligence, Envivio, Alliance Consulting, Acsis and Laureate Pharmaceuticals.

Jessica Schell – EVP BD and Strategic Planning, Universal Pictures. Fmr SVP Digital Strategy and Business Development, NBC Universal. Board: World Wide Biggies.

Barry Silbert – CEO of SecondMarket.

Josh Silverman – President of US Consumer Services, American Express. Fmr CEO, Skype. Fmr CEO, Shopping.com. Fmr CEO and Fndr, eVite.

Sukhinder Singh Cassidy – Chm, JOYUS. Fmr CEO, Polyvore. Fmr President of Asia Pacific and Latin America, Google. Boards: TripAdvisor (TRIP) and Formspring.

Megan Smith – VP Business Development, Google. Fmr CEO, PlanetOut.

Charles Songhurst -- GM and Head of Strategy and M&A, Microsoft. MD, Katana Capital.

Angelo Sotira – CEO, DeviantArt.

Bret Stephens -- Member of Editorial Board, Wall Street Journal. Main Foreign Affairs Columnist, Wall Street Journal. Fmr Editor-in-Chief, Jerusalem Post.

Simon Stevens – EVP, UnitedHealth Group. Fmr CEO, Ovations (revenues of $31 billion). Fmr Health Policy Director to British Prime Minister Tony Blair.

Henry Sweica – CEO, Talpion Fund Management. Fmr co-founder, Highbridge Capital Management.

Alexander Tamas - Partner, DST. Boards: Forticom, mail.ru

Peter Thiel -- CEO of Thiel Capital. Managing Director, Founders Fund. Fmr founder and CEO of PayPal. Boards: Facebook and Palantir.

Steve Wayne – CEO, Jensen Group.

Will Wechsler – Deputy Asst. Sec of Defense for Counternarcotics and Global Threats.

Adam Weiss – co-CEO, Scout Capital.

Katharine Weymouth – Publisher, Washington Post.

Michael Wolf – CEO, Activate. fmr President and COO, MTV Networks. Fmr Prtnr, McKinsey. Former Senior Partner, Booz Allen & Hamilton.

Paul Wolpe – Director, Center of Ethics. Prof of Bioethics, Emory. Sr Bioethicist, NASA. Co-Editor, American Journal of Bioethics.

Jed York – CEO of San Francisco 49ers.

Lauren Zalaznick – Chairman, Entertainment & Digital Networks and Integrated Media, NBCUniversal. She oversees Bravo, Oxygen Media, Style, PBS Sprout, Telemundo, iVillage, Swirl, Daily Candy, and Fandango.

Eric Zinterhofer – co-CEO, Searchlight Capital. Chm, Charter Communications. Fmr Sr Partner, Apollo Management. Boards: Central European Media Enterprises, Dish TV India.

Karl-Theodor zu Guttenberg – fmr Minister of Defense, Germany. Fmr Minister of Economics and Technology, Germany.

AFFIDAVIT OF BRADLEY JAMES EDWARDS

1. I am an attorney in good standing with the Florida Bar and admitted to practice in the Southern District of Florida. I am a partner in the law firm of Farmer Jaffe Weissing Edwards Fistos and Lehrman.

2. I am the lead attorney currently representing "Jane Doe" in the case of Jane Doe v. Jeffrey Epstein, case number 08-80893 in federal Court in the Southern District of Florida. I am the lead attorney representing Jane Doe, whose civil complaint alleges that Epstein sexually molested her numerous occasions when she was a minor.

3. Defendant Epstein has entered into a "non-prosecution agreement" (NPA) with the federal government for sex crimes against minors. Under that agreement, the federal government has agreed not to file criminal charges against Epstein for sex crimes committed against approximately thirty girls, including Jane Doe. In exchange, Epstein agreed to plead guilty to state law criminal charges involving solicitation of prostitution and procuring a minor for prostitution. The victim of the criminal charges to which he has pled was not Jane Doe.

4. Under the NPA, Epstein has agreed not to contest civil liability of any of his approximately thirty victims -- provided that the victim agrees to limit themselves to the damages provided by 18 U.S.C. § 2255 (currently set at $150,000). Jane Doe has not agreed to limit herself to pursuing only $150,000 in damages. Therefore, the terms of the NPA purport to prevent Jane Doe from using the NPA to prove liability.

5. Epstein has filed an answer to Jane Doe's complaint, in which he has invoked his Fifth Amendment right to silence with respect to the allegations that he molested her as a child. Epstein has further argued that this Fifth Amendment invocation is the functional equivalent of, and must be treated as, a specific denial of the allegations.

6. Defendant Epstein's deposition has been taken on several occasions, in this and other related cases, and he has not provided any substantive discovery whatsoever. Instead, he invoked his 5th amendment privilege against self-incrimination when asked questions about his abuse of Jane Doe or other girls.

7. Defendant Epstein has also been served with Interrogatories and requests for production; all requests have been met with 5th amendment assertions and Epstein has not given Jane Doe any substantive testimony related her allegations.

8. Jane Doe's complaint contains a punitive damages claim, and Mr. Epstein has also elected to invoke the 5th Amendment on all questions that would relate to punitive damages issues, such as his intent when committing the crimes, his lack of remorse and his intent to recidivate.

9. Epstein has taken Jane Doe's deposition. During that deposition he has asked numerous questions of Jane Doe that suggest that she is fabricating her allegation of abuse by Epstein.

10. In addition to deposing Mr. Epstein, other attorneys and I have taken the depositions of his various co-conspirators (as labeled by the federal government in the NPA), including [redacted], [redacted] and [redacted]. Each of those individuals was employed by Epstein to bring him underage girls for him to molest and to ensure that he was protected from detection by law enforcement, and thus those individuals could likely provide general testimony that would assist Plaintiff in proving liability and damages, including punitive damages. However, none of these individuals were

present during acts of sexual abuse by Epstein. In any event, ALL of those individuals have also invoked their 5th amendment rights against self-incrimination, and thus have left Plaintiff with no information about what Epstein or other conspirators inside his house were doing during the sexual abuse of Jane Doe and other minors girls. This creates a serious issue for Jane Doe in proving her sexual molestation claim against Epstein. By its nature, sexual molestation takes place in private, with only the abuser and the victim typically available to testify. In this case, Epstein's abuse of Jane Doe took place in private, with only Epstein and Jane Doe present during the abuse. Jane Doe has no other reasonable avenues of discovery to provide direct proof of claim of sexual abuse by Epstein.

11. Additionally, Mr. Epstein has recently filed a lawsuit against me personally that has no merit whatsoever, a fact known to Mr. Epstein and his attorneys. He filed the lawsuit against Brad Edwards, Scott Rothstein, and L.M. (another Epstein victim of his molestation). That lawsuit implies that [redacted]'s civil case against him (currently pending in Florida state court) is fabricated and that [redacted] and I have conspired to commit fraud against him (presumably that she made up the case against him, implying that he does not know [redacted]. While the present subpoena before the Court has been filed by Jane Doe, the Court should be aware that attorneys representing [redacted] may also file a subpoena for the George Rush tape shortly.

12. Despite Mr. Epstein and all of his co-conspirators, asserting a 5th amendment privilege against self-incrimination, George Rush of the New York Daily news did contact me to inform me that Mr. Epstein spoke personally with him about issues related to the various charges of sex abuse against him.

13. Paraphrasing from memory of my conversation with Mr. Rush, Mr. Epstein told him that he may have come "too close to the line" but that he should not have been punished as severely as he was and that his conduct was at most worthy of a $100 fine. This is a statement that shows two things of great importance to Jane Doe's pending civil action. First, it is in effect an admission by Epstein of his liability to Jane Doe for sexually abusing her. Jane Doe does not have any other admission of Epstein of his sexual abuse of her and Epstein has filed an answer to Jane Doe's complaint that has the functional effect of denying abuse of her. Jane Doe has diligently pursued all possible ways of obtaining an admission from Epstein of his molestation of Jane Doe without success. Second, the statement to Mr. Rush is a clear demonstration that Epstein lacks remorse for committing felony child molestation against Jane Doe. This will be a central issue in the punitive damages case against Epstein at trial. Here again, Jane Doe has diligently pursued all possible ways of obtaining a statement from Epstein about his lack of remorse for abusing Jane Doe without success. There are no other reasonable means of obtaining a statement from Epstein on these subjects.

14. Mr. Rush also told me that Mr. Epstein spoke specifically about one of my clients, [redacted] and he made derogatory remarks about her.

15. Additionally, Mr. Rush said that Epstein spoke directly about another civil case that was filed against him (Jane Doe 102 v. Epstein); that case alleges that Epstein repeatedly sexually abused a 15 year old girl, forced her to have sex with his friends and flew her on his private plane nationally and internationally for the purposes of sexually molesting and abusing her. Epstein flippantly told George Rush that that case was dismissed, in a way to indicate that the allegations are ridiculous and untrue.

16. Mr. Rush indicated that he taped the conversation between him and Mr. Epstein.

17. Mr. Rush also spoke at length to Michael Fisten, an investigator with my firm that was assisting with the investigation of the case. Mr. Fisten reported to me shortly after the conversation with Mr. Rush that he had such a conversation.

18. While research by other plaintiffs' attorneys and myself has uncovered other persons that were acquaintances of Mr. Epstein, specifically Donald Trump, Alan Dershowitz, Bill Clinton, Tommy Mottola, and David Copperfield, we have no information that any of those people (other than Mr. Dershowitz) have spoken to Mr. Epstein about Jane Doe or any of the other specific victims of Mr. Epstein's molestation. Mr. Dershowitz is acting as an attorney for Mr. Epstein, and therefore it is presumably unlikely to question him about any admissions that Epstein may have made regarding Jane Doe or other minors girls. Additionally, we have no information that any of those individuals or any other individuals have any taped statements of Epstein's own voice relating to these matters. George Rush's taped conversation with Mr. Epstein is the only known one in existence, making it very unique and it contains information not otherwise obtainable through other means or sources. Indeed, without the Rush tape conversation, the jury that handles the case will not hear any words from Epstein himself about his abuse of Jane Doe and other young girls. I have been informed by Epstein's attorney that Epstein intends to invoke his Fifth Amendment rights rather than answer any substantive questions about the abuse of Jane Doe and other girls at trial.

19. The Rush interview is, in any event, unique and not otherwise obtainable from other witnesses because it can be used to prove perjury (a federal crime) on the part of Epstein. Epstein lied about not knowing George Rush. See deposition of Jeffrey Epstein, taken in [redacted] v. Jeffrey Epstein, case 50-2008-CA-028051, page 154, line 4 through 155 line 9, wherein Jeffrey Epstein clearly impresses that he does not recognize George Rush from the New York Daily News, despite the fact that he gave a personal interview that we all now know to have been tape recorded. It is therefore evidence of a criminal event. If we receive the tape, we intend to alert the appropriate law enforcement authorities, both federal and state, so that they can pursue any appropriate criminal investigation perjury charges.

20. The tape is also crucial for [redacted] to dismiss the frivolous complaint filed by Jeffrey Epstein against her, as he clearly acknowledges knowing [redacted] contrary to claims he makes in his complaint against her and also contradictory to other statements he has made in depositions related to knowing L.M. In that regard, this tape provides evidence of other false statements Epstein has made under oath.

21. During a telephone call with George Rush, he provided me more than a description of the tape, and in fact described the general tenor of the entire interview, so that nothing in the interview can be fairly regarded as confidential at this point.

22. As George Rush admitted in his affidavit, he played the tape for *at least* two other persons who also confirmed Epstein's arrogance as he speaks about his actions with minors.

23. The people for whom George Rush played the tape or told in detail of the information on the tape were not "sources" in the tradition sense of the word – all individuals were simply chatting with Mr. Rush about Mr. Epstein and his propensity to molest children. For example, when I discussed the tape with Mr. Rush, I was not a "source" in the traditional sense of that term. At no point did Mr. Rush tell me that I was a "source" for his reporting.

24. Because Epstein and all other co-conspirators have invoked the 5th amendment as to all relevant questions, this tape is the *only* way that Jane Doe can put Epstein's own perceptions of what he has done before the jury and the only way that Jane Doe can put Epstein's admissions and statement s before the jury. As even a quick perusal of the more than 500 entries on the docket sheet for Jane Doe's (consolidated) case will confirm (see Case no. 9:08-80119 (S.D. Fla.) (case number for consolidated cases on discovery), Jane Doe and other plaintiffs have made exhaustive attempts to obtain information from Epstein about his abuse. These attempts have included repeated requests for admission, requests for production, interrogatories, and depositions – all the means that are listed in the Federal Rules of Civil Procedure for obtaining discovery. These means have all been exhausted without success. Neither

Jane Doe nor any of the other plaintiffs have been able to obtain even a single word of information from Epstein about his abuse of minor girls.

25. I made a good faith, albeit unsuccessful, effort to resolve this matter with Anne B. Carroll, representing the Daily News in order to avoid any court intervention. I explained that we needed this tape for several reasons, including those cited by her in her pleading. The tape is detrimental to Epstein's personal complaint against [redacted] and me; the tape is evidence of perjury committed by Epstein; the tape is the Best Evidence of his lack of remorse for his actions and will be presented in the punitive damages phase of the civil trials against him; and, perhaps most important, the tape is the only way that the jury considering Jane Doe's case will be able to hear Epstein's voice and own statements about his abuse of Jane Doe and other minor girls. Without the tape, the jury will not have the opportunity to hear Epstein give any substantive information about Jane Doe's complaint. Indeed, they will not have the opportunity to even hear Epstein's voice utter any substantive words other than (in essence) "I take the Fifth." As part of our discussion, Ms. Carroll told me that it was a "stupid move" for Mr. Rush to play the tape or disclose the tape to other people as he likely waived any privilege and that, as a result of disclosing the tape, he was at risk of losing his job. I responded that it did not seem fair that Mr. Rush lose his job or be punished in any way, but that I had an absolute duty to represent my client and that I would be failing in that duty if I did not pursue this critical piece of evidence.

I declare under penalty of perjury that the foregoing is true and correct.

FURTHER AFFIANT SAYETH NAUGHT.

Dated this 23rd day of April, 2010.

Brad Edwards, Esq.

The foregoing instrument was acknowledged before me this 23rd day of April, 2010 by BRAD EDWARDS, who is personally known to me.

NOTARY PUBLIC

Print Name:_____

My Commission Expires:

MARIA W. KELLICHAN
MY COMMISSION # DD 613393
EXPIRES: August 11, 2012
Bonded Thru Notary Public Underwriters

EXHIBIT N

AFFIDAVIT OF BRADLEY JAMES EDWARDS

1. I am an attorney in good standing with the Florida Bar and admitted to practice in the Southern District of Florida. I am currently a partner in the law firm of Farmer, Jaffe, Weissing, Edwards, Fistos & Lehrman, P.L.

2. In 2008, I was a sole practitioner running a personal injury law firm in Hollywood, FL. While a sole practitioner I was retained by three clients, [redacted] [redacted], and Jane Doe to pursue civil litigation against Jeffrey Epstein for sexually abusing them while they were minor girls. I agreed to represent these girls, along with attorney Jay Howell (an attorney in Jacksonville, Florida with Jay Howell & Associates) and Professor Paul Cassell (a law professor at the University of Utah College Of Law). I filed state court actions on behalf of [redacted]. and [redacted] and a federal court action on behalf of Jane Doe. All of the cases were filed in the summer of 2008.

3. My clients received correspondence from the U.S. Department of Justice regarding their rights as victims of Epstein's federal sex offenses. (True and accurate copies of the letters are attached to Statement of Undisputed Facts as Exhibit "M")

4. In mid June 2008, I contacted Assistant United States Attorney Marie Villafaña to inform her that I represented Jane Doe #1([redacted]) and, later, Jane Doe #2([redacted]). I asked to meet to provide information regarding Epstein. AUSA Villafaña did not advise me that a plea agreement had already been negotiated with Epstein's attorneys that would block federal prosecution. AUSA Villafaña did indicate that federal investigators had concrete evidence and information that Epstein had sexually molested at least 40 underage minor females, including [redacted], Jane Doe and [redacted]

5. I also requested from the U.S. Attorney's Office the information and evidence that they had collected regarding Epstein's sexual abuse of his clients. However, the U.S. Attorney's Office declined to provide any such information to me. The U.S. Attorney's Office also declined to provide any such information to the other attorneys who represented victims of Epstein's sexual assaults.

6. I was informed that on Friday, June 27, 2008, at approximately 4:15 p.m., AUSA Villafaña received a copy of Epstein's proposed state plea agreement and learned that the plea was scheduled for 8:30 a.m., Monday, June 30, 2008. She called me to provide notice to my clients regarding the hearing. She did not tell me that the guilty pleas in state court would bring an end to the possibility of federal prosecution pursuant to the plea agreement. My clients did not learn and understand this fact until July 11, 2008, when the agreement was described during a hearing held before Judge Marra on the Crime Victims' Rights Act action that I had filed.

7. In the summer of 2008 I filed complaints against Jeffrey Epstein on behalf of [redacted], [redacted], and Jane Doe.

8. In the Spring of 2009 (approximately April), I joined the law firm of Rothstein, Rosenfeldt and Adler, P.A. ("RRA"). I brought my existing clients with me when I joined RRA, including [redacted], [redacted], and Jane Doe. When I joined the firm, I was not aware that Scott Rothstein was running a Ponzi scheme at RRA. Had I known such a Ponzi scheme was in place, I would never have joined RRA.

9. I am now aware that it has been alleged that Scott Rothstein made fraudulent presentations to investors about the lawsuits that I had filed on behalf of my clients against Epstein and that it has been alleged that these lawsuits were used to fraudulently lure investors into Rothstein's Ponzi scheme. I never met a single investor, had no part in any such presentations and had no knowledge any such fraud was occurring. If these allegations are true, I had no knowledge that any such fraudulent presentations were occurring and no knowledge of any such improper use of the case files.

10. Epstein's Complaint against me alleges that Rothstein made false statements about cases filed against Epstein, i.e., that RRA had 50 anonymous females who had filed suit against Epstein; that Rothstein sold an interest in personal injury lawsuits, reached agreements to share attorneys fees with non-lawyers, paid clients "up front" money; and that he used the judicial process to further his Ponzi scheme. If Rothstein did any of these things, I had no knowledge of his actions. Because I maintained close contact with my clients, [redacted], [redacted] and Jane Doe, and Scott Rothstein never met any of them, I know for certain that none of my clients were paid "up front" money by anyone.

11. Epstein alleges that I attempted to take the depositions of his "high profile friends and acquaintances" for no legitimate litigation purpose. This is untrue, as all of my actions in representing [redacted]., [redacted]., and Jane Doe were aimed at providing them effective representation in their civil suits. With regard to Epstein's friends, through documents and information obtained in discovery and other means of investigation, I learned that Epstein was sexually molesting minor girls on a daily basis and had been for many years. I also learned the unsurprising fact that he was molesting the girls in the privacy of his mansion in West Palm Beach, meaning that locating witnesses to corroborate their testimony would be difficult to find. I also learned, from the course of the litigation, that Epstein and his lawyers were constantly attacking the credibility of the girls, that Epstein's employees were all represented by lawyers who apparently were paid for (directly or indirectly) by Epstein, that co-conspirators whose representation was also apparently paid for by Epstein were all taking the Fifth (like Epstein) rather than provide information in discovery. For example, I was given reason to believe that [redacted], Larry Visoski, Larry Harrison, David Rogers, Louella Rabuyo, [redacted], [redacted], Ghislaine Maxwell, Mark Epstein, and Janusz Banasiak all had lawyers paid for by Epstein. Because Epstein and the co-conspirators in his child molestation criminal enterprise blocked normal discovery avenues, I needed to search for other ordinary approaches to strengthen the cases of my clients. Consistent with my training and experience, these other ordinary approaches included finding other witnesses who could corroborate allegations of sexual abuse of my clients or other girls. Some of these witnesses were friends of Epstein. Given his social status, it also turned out that some of his friends were high-profile individuals.

12. In light of information I received suggesting that British socialite Ghislaine Maxwell, former girlfriend and long-time friend of Epstein's, was involved in managing Epstein's affairs and companies I had her served for deposition for August 17, 2009. (Deposition Notice attached to Statement of Undisputed Facts as Exhibit BB). Maxwell was represented by Brett Jaffe of the New York firm of Cohen and Gresser, and I understood that her attorney was paid for (directly or indirectly) by Epstein. She was reluctant to give her deposition, and I tried to work with her attorney to take her deposition on terms that would be acceptable to both sides. Her attorney and I negotiated a confidentiality agreement, under which Maxwell agreed to drop any objections to the deposition. Maxwell, however, still avoided the deposition. On June 29, 2010, one day before I was to fly to NY to take Maxwell's deposition, her attorney informed me that Maxwell's mother was deathly ill and Maxwell was consequently flying to England with no intention of returning and certainly would not return to the United States before the conclusion of Jane Doe's trial period (August 6, 2010). Despite that assertion, I later learned that Ghislaine Maxwell was in fact in the country on approximately July 31, 2010, as she attended the wedding of Chelsea Clinton (former President Clinton's daughter) and was captured in a photograph taken for US Weekly magazine.

13. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Donald Trump's deposition in the civil suits against him. Trump was properly noticed because: (a) after review of the message pads confiscated from Epstein's home, the legal and investigative team assisting my clients learned that Trump called Epstein's West Palm Beach mansion on several occasions during the time period most relevant to my clients' complaints; (b) Trump was quoted in a *Vanity Fair* article about Epstein as saying **"I've known Jeff for fifteen years. Terrific guy." "He's a lot of fun to be with. It is even said that he likes beautiful women as much as I do, and many of them are on the younger side. No doubt about it – Jeffrey enjoys his social life."** Jeffrey Epstein: International Moneyman of Mystery; **He's pals with a passel of Nobel Prize–winning scientists, CEOs like Leslie Wexner of the Limited, socialite Ghislaine Maxwell, even Donald Trump. But it wasn't until he flew Bill Clinton, Kevin Spacey, and Chris Tucker to Africa on his private Boeing 727 that the world began to wonder who he is. By Landon Thomas Jr.**; (c) I learned through a source that Trump banned Epstein from his Maralago Club in West Palm Beach because Epstein sexually assaulted an underage girl at the club; (d) Jane Doe No. 102's complaint alleged that Jane Doe 102 was initially approached at Trump's Maralago by Ghislaine Maxwell and recruited to be Maxwell and Epstein's underage sex slave; (e) Mark Epstein (Jeffrey Epstein's brother) testified that Trump flew on Jeffrey Epstein's plane with him (the same plane that Jane Doe 102 alleged was used to have sex with underage girls) deposition of Mark Epstein, September 21, 2009 at 48-50; (f) Trump visited Epstein at his home in Palm Beach – the same home where Epstein abused minor girls daily; (g) Epstein's phone directory from his computer contains 14 phone numbers for Donald Trump, including emergency numbers, car numbers, and numbers to Trump's security guard and houseman. Based on this information, I believed that

Trump might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

14. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Alan Dershowitz's deposition in the civil suits against him. Dershowitz was properly noticed because: (a) Dershowitz has been friends with Epstein for many years; (b) in one news article Dershowitz comments that, "I'm on my 20th book... The only person outside of my immediate family that I send drafts to is Jeffrey" The Talented Mr. Epstein, By Vicky Ward on January, 2005 in Published Work, Vanity Fair; (c) Epstein's housekeeper Alfredo Rodriguez testified that Dershowitz stayed at Epstein's house during the years most relevant to my clients; (d) Rodriguez testified that Dershowitz was at Epstein's house at times when underage females where there being molested by Epstein (see Alfredo Rodriguez deposition at 278-280, 385, 426-427); (e) Dershowitz was reportedly involved in persuading the Palm Beach State Attorney's office not to file felony criminal charges against Epstein because the underage females lacked credibility and thus could not be believed that they were at Epstein's house, despite him being an eyewitness that the underage girls were actually there; (f) Jane Doe No. 102 stated generally that Epstein forced her to be sexually exploited by not only Epstein but also Epstein's "adult male peers, including royalty, politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories that Dershowitz and acquaintances of Dershowitz fall into; (g) during the years 2002-2005 Alan Dershowitz was on Epstein's plane on several occasions according to the flight logs produced by Epstein's pilot and information (described above) suggested that sexual assaults may have taken place on the plane; (h) Epstein donated Harvard $30 Million dollars one year, and Harvard was one of the only institutions that did not return Epstein's donation after he was charged with sex offenses against children. Based on this information, I believed that Dershowitz might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

15. Epstein alleges that there was something improper in the fact that I notified him that I intended to take Bill Clinton's deposition. Clinton was properly noticed because: (a) it was well known that Clinton was friends with Ghislaine Maxwell, and several witnesses had provided information that Maxwell helped to run Epstein's companies, kept images of naked underage children on her computer, helped to recruit underage children for Epstein, engaged in lesbian sex with underage females that she procured for Epstein, and photographed underage females in sexually explicit poses and kept child pornography on her computer; (b) newpaper articles stated that Clinton had an affair with Ghislaine Maxwell, who was thought to be second in charge of Epstein's child molestation ring. The Cleveland Leader newspaper, April 10, 2009; (c) it was national news when Clinton traveled with Epstein (and Maxwell) aboard Epstein's private plane to Africa and the news articles classified Clinton as Epstein's friend; (d) the flight logs for the relevant years 2002 - 2005 showed Clinton traveling on Epstein's plane on more than 10 occasions and his assistant, Doug Band, traveled on many more occasions; (e) Jane Doe No. 102 stated generally that she was required by Epstein to be sexually

exploited by not only Epstein but also Epstein's "adult male peers, including royalty, politicians, academicians, businessmen, and/or other professional and personal acquaintances" – categories Clinton and acquaintances of Clinton fall into; (f) flight logs showed that Clinton took many flights with Epstein, Ghislaine Maxwell, [redacted] and [redacted] -- all employees and/or co-conspirators of Epstein's that were closely connected to Epstein's child exploitation and sexual abuse; (g) Clinton frequently flew with Epstein aboard his plane, then suddenly stopped – raising the suspicion that the friendship abruptly ended, perhaps because of events related to Epstein's sexual abuse of children; (h) Epstein's personal phone directory from his computer contains e-mail addresses for Clinton along with 21 phone numbers for him, including those for his assistant (Doug Band), his schedulers, and what appear to be Clinton's personal numbers. Based on this information, I believed that Clinton might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

16. Epstein alleges that Tommy Mottola was improperly noticed with a deposition. I did not notice Mattola for deposition. He was noticed for deposition by a law firm representing another one of Epstein's victims – not by me.

17. Epstein alleges that there was something improper in the fact that I notified him that I intended to take the illusionist David Copperfield's deposition. Copperfield was properly noticed because: (a) Epstein's housekeeper Alfredo Rodriguez testified that David Copperfield was a guest on several occasions at Epstein's house; (b) according to the message pads confiscated from Epstein's house, Copperfield called Epstein quite frequently and left messages that indicated they socialized together; (c) Copperfield himself has had similar allegations made against him by women claiming he sexually abused them; (d) one of Epstein's sexual assault victims also alleged that Copperfield had touched her in an improper sexual way while she was at Epstein's house. Based on this information, I believed that Copperfield might have relevant information to provide in the cases against Jeffrey Epstein and accordingly provided notice of a possible deposition.

18. Epstein alleges that there was something improper in the fact that I identified Bill Richardson as a possible witness against him in the civil cases. Richardson was properly identified as a possible witness because Epstein's personal pilot testified to Richardson joining Epstein at Epstein's New Mexico Ranch. See deposition of Larry Morrison, October 6, 2009, at 167-169. There was information indicating that Epstein had young girls at his ranch which, given the circumstances of the case, raised the reasonable inference he was sexually abusing these girls since he had regularly and frequently abused girls in West Palm Beach and elsewhere. Richardson had also returned campaign donations that were given to him by Epstein, indicating that he believed that there was something about Epstein that he did not want to be associated with. Richardson was not called to testify nor was he ever subpoenaed to testify.

19. Epstein alleges that discovery of plane and pilot logs was improper during discovery in the civil cases against him. Discovery of these subjects was clearly proper and

necessary because: (a) Jane Doe filed a federal RICO claim against Epstein that was an active claim through much of the litigation. The RICO claim alleged that Epstein ran an expansive criminal enterprise that involved and depended upon his plane travel. Although Judge Marra dismissed the RICO claim at some point in the federal litigation, the legal team representing my clients intended to pursue an appeal of that dismissal. Moreover, all of the subjects mentioned in the RICO claim remained relevant to other aspects of Jane Doe's claims against Epstein, including in particular her claim for punitive damages; (b) Jane Doe also filed and was proceeding to trial on a federal claim under 18 U.S.C. § 2255. Section 2255 is a federal statute which (unlike other state statutes) guaranteed a minimum level of recovery for Jane Doe. Proceeding under the statute, however, required a "federal nexus" to the sexual assaults. Jane Doe had two grounds on which to argue that such a nexus existed to her abuse by Epstein: first, his use of the telephone to arrange for girls to be abused; and, second, his travel on planes in interstate commerce. During the course of the litigation, I anticipated that Epstein would argue that Jane Doe's proof of the federal nexus was inadequate. These fears were realized when Epstein filed a summary judgment motion raising this argument. In respo-nse, the other attorneys and I representing Jane Doe used the flight log evidence to respond to Epstein's summary judgment motion, explaining that the flight logs demonstrated that Epstein had traveled in interstate commerce for the purpose of facilitating his sexual assaults. Because Epstein chose to settle the case before trial, Judge Marra did not rule on the summary judgment motion. (c) Jane Doe No. 102's complaint outlined Epstein's daily sexual exploitation and abuse of underage minors as young as 12 years old and alleged that he used his plane to transport underage females to be sexually abused by him and his friends. The flight logs accordingly might have information about either additional girls who were victims of Epstein's abuse or friends of Epstein who may have witnessed or even participated in the abuse. Based on this information, I believed that the flight logs and related information was relevant information to prove the cases against Jeffrey Epstein and accordingly I pursued them in discovery.

20. In approximately November 2009, the existence of Scott Rothstein's Ponzi scheme became public knowledge. It was at that time that I, along with many other reputable attorneys at RRA, first became aware of Rothstein criminal scheme. At that time, I left RRA with several other RRA attorneys to form the law firm of Farmer Jaffe Weissing Edwards Fistos and Lehrman ("Farmer Jaffe"). I was thus with RRA for less than one year.

21. In July 2010, along with other attorneys at Farmer Jaffe and Professor Cassell, I reached favorable settlement terms for my three clients [redacted], [redacted], and Jane Doe in their lawsuits against Epstein.

22. On July 20, 2010, I received a letter from the U.S. Attorney's Office for the Southern District of Florida – the office responsible for prosecuting Rothstein's Ponzi scheme. The letter indicated that law enforcement agencies had determined that I was "a victim (or potential victim)" of Scott Rothstein's federal crimes. The letter informed me of my rights as a victim of Rothstein's federal crimes and promised to keep me informed about

subsequent developments in his prosecution. A copy of this letter is attached to this Affidavit. (A copy of the letter is attached to Statement of Undisputed Facts as Exhibit UU)

23. Jeffrey Epstein also filed a complaint with the Florida Bar against me. His complaint alleged that I had been involved in Rothstein's scheme and had thereby violated various rules of professional responsibility. The Florida Bar investigated and dismissed the complaint.

24. I have reviewed the Statement of Undisputed Facts filed contemporaneously with this Affidavit. Each of the assertions concerning what I learned, what I did, and the good faith beliefs formed by me in the course of my prosecutions of claims against Jeffrey Epstein as contained in the Statement of Undisputed Facts is true, and the foundations set out as support for my beliefs are true and correct to the best of my knowledge.

25. All actions taken by me in the course of my prosecution of claims against Jeffrey Epstein were based upon a good faith belief that they were reasonable, necessary, and ethically proper to fulfill my obligation to zealously represent the interests of my clients.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: 9/21, 2010

Bradley J. Edwards, Esq.

THE NEARNESS OF GRACE

A PERSONAL SCIENCE OF SPIRITUAL TRANSFORMATION

Arnold J. Mandell

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ACKNOWLEDGEMENTS

Appreciation is expressed to the Fetzer Institute for their support of this work. Particular thanks are due their imaginative Vice President, Dr. Paul Gailey, who shared my vision and hope that these somewhat disparate themes could be blended into a meaningful whole. Time and the reading by others will tell whether this idea was realized. The Fetzer Foundation and Dr. Gailey have facilitated exploration into blends of science and spirituality, particularly in the context of personal meaning. They also have a history of supporting serious work in this era's most powerful and rigorous exercise in holism as represented by the mathematical and applied mathematical fields of modern dynamical systems theory. Fetzer's very special environment and years of dedication have encouraged the variety of personal meanings within science to emerge and be recognized as legitimate and important parts of the research enterprise. It would be difficult to imagine a more propitious context for this effort.

The book is dedicated to my daughter Buna, and to my intellectual and creative companion, Dr. Karen Selz, whose deep and lovely mind wrote much more of this book than is formally acknowledged.

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CHAPTER 1:

IN SEARCH OF THE MIRACULOUS

More than a half-century of naïve persistence and driven search for unity in the biophysics of mind and personal spirituality as the basis for healing transformation has led me into many laboratories. The motivation may have been genetic. My father said that we were descended from several generations of Jewish mystics, none of them able to attain the salaried status of rabbi or cantor. These ecstatic men lived lives of peripatetic eccentricity, stirring congregations with provocative insights and uncomfortably personal inquiry. But only for a little while. Soon they were asked to leave the synagogue and often their Eastern European Jewish townships called shtetels as well.

My father, in the first generation of our family without rabbis in over a Century, was a businessman-musician, who in the early mornings studied Talmudic commentaries. He taught me about why it was that most interpretations of the book by the rational, physician, lawyer, philosopher, Moses Maimonides, called *Guide for the Perplexed*, were in error in their assumption that man *cannot* understand God's nature with his mind. He took issue with the opinion that the union of a person's intellect and Spirit with Him was not possible as long as a person was living. Ibn Tibbon, Maimonides' best-known early translator and interpreter, relegated the cognitive, analytical, physical and alchemical transformational sciences to the earthly, not spiritual realm. My father disagreed. He espoused the work of the 13th

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Century proponent of a school of Jewish ecstatic mysticism, Abraham Abulafia, whose interpretation of the *Guide* and his own *Commentary on the Secrets* taught that the human mind, *if transformed into a "state of active intellect,"* could become one with Spirit, realizing the Kingdom of God in rational mystical experience in a state of excitement with new ideas. The new consciousness achieves deep knowledge of both the "upper" and "lower" realms of what he called "reality" both spontaneously and directly. He said that without personal transformation, this knowing is not possible.

Abulafia's lesson was that the mundane intellect of man has the potential for transformation into another kind of mind in a spiritualization of thought. This occurs via developmental stages that begin with intellect and imagination and culminate in what he called prophetic emanations. The exercises leading to this transformation are to be strongly willed and practiced with regularity. This work results in ascension to an ecstatic state accompanied by great intuitive powers, which Abulafia called "prophesy." Ibn Adret, the Chief Rabbi of Spain at the end of the Thirteenth Century, banished Abulafia from the Country, a Century before the Spanish Inquisition ousted all the Jews.

Following what my father said was required in the practice of *Kabbalah*, a 13th Century tradition of esoteric and mystical interpretations of the Scriptures, I learned the secret meanings of each of the twenty-two letter Hebrew alphabet. Much like the Platonic view of mathematics, that it existed before the physical universe, these symbolic equivalences were believed to be eternal in the transcendental realm. One of the rare written accounts of this oral tradition is in the thirteenth-century Hebrew *Book of Splendor* called the *Zohar* which describes the Hebrew alphabet as the heavenly code of the cosmos.

I learned that the *Tegragrammaton's* repeated letter *Hei*, being fifth in the Hebrew alphabet, represents the number five. In the Kabbalistic tradition, *Hei* implicates the functional five-partition of the human inner self or soul. The five parts are: *nefesh*, instinctual drives; *ruach*, mood, affect and emotions; *neshamah*, cognitive activities of the mind; *chayah*, efforts to understand and attain transcendence; *yechidah*, experiencing the world as a cosmic unity. Later in life as

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a psychoanalytical neuroscientist with a computational bent, the partitions divided thoughtful, forewarning forebrain from automatic and stereotyped hind brain, the signal analyzing thalamocortical system from the emotional and impulsive brain stem-limbic, the symbolically logical left from intuitively geometric right hemispheres. We divide the neurotransmitter moods of dopamine aggression from the transcendentally erotic serotonin and the organized dynamical states of periodicity and quasi(multi)periodicity from the real world complexity of chaos. I learned that it is comforting to divide an unknown whole into two or more unknowable parts.

The Jewish guru and Hebraic tutor of my childhood, Rabbi Isadore Kliegfeld, smiled when I told him about my sudden loss of panic during nighttime Hebrew letter meditations. He said that I had had received personal evidence that these powerful symbols could call forth the transformational powers of God. He said that I had been given a blessing, in Yiddish, a *nachas.* Maybe panic is not that far from the transcendence of an activated mind.

In my tenth summer, behind closed door in a hot back bedroom, first by accidental touch and then by more systematic chaffing, I evoked a pleasurably urgent and yawning feeling that began in the lower part of my abdomen and back. It filled me with thought emptying fullness that a sudden involuntary burst of pelvic contractions found resolution in an hour or two of an unexplainable sadness. I had been struggling to understand my father's well warn copy of William James's *Varieties of Religious Experience* and I wondered if I had been visited by one of the altered states he described. Was this what he meant by a transformative experience? A few months later, a late night meditation produced physical evidence, a thick, sticky, salty sweet stuff that by morning stuck my sheets together. Later that year, in my father's library, I found a translation of the 1500 BCE *Egyptian Book of the Dead*. It contained a creation myth of two Gods in which "rubbing with my fist, my heart came into my mouth and I spat forth Shu and Tefnut." Psalm 23, read rather regularly in Sunday school, began to make me wonder about the meanings of"...rod and staff that comforts..." and what was meant by "...my cup runneth over." Among the ten regions of the *Zohar*, connecting the inner world of

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man to the upper world, is the tree of ten *sefirot* in which *Yesod* , the phallus, occupies a central place. Now we're allowed to know that G-spot stimulation of the para-urethral glands in the female can result in spurt as well as a cup that runneth over.

Other occasions of the temporal disappearance of the self-conscious I occurred while doing the theorem and proof work of high school geometry. Axioms and the rule bound processes of deduction created difficult journeys from that which was given to what should be found. Rocking back and forth in a desk chair for hours, chewing on fingernails, cuticles and pencil ends, time disappeared in a none self aware state of work-a-day well-being. Sri Aurobindo's *Bhagadvad Gita* described this state as one of the rewards of *karma yoga*. Abulafia's Kabalistic School emphasized the importance of *hitbodedut*, detachment and seclusion in concentrated thought, as a technique for the attainment of spiritual "intensification." Stacks of lined yellow paper piled up full of blind alleys as I lived in humbling dumbness. One of my teachers of mathematics described it as the working mathematician's dark night of the soul. A breakthrough to a route from premises to proof brought an expansive rush.

Engagement in a struggle to fuse two differing contextual worlds may be transporting. Geometric visions can be used to do imageless algebra in a brain state that feels like intuition. The brain does something like this: Let the number of a sequence of unit squares, each side of measuring 0 to 1, be the denominator of a series of fractions, say fifths. Now put five of these boxes in a row. Then the sequence of all possible fifths, 0/5,1/5, 2/5,..5/5, is inscribed by cutting the vertical sides of the five sequential squares with a diagonal from the lower left of the first one to the upper right corner of the last. This line cuts each sequential square's front boundary with vertical lengths, 0.0, 0.2, 0.4…1.0 in a series of decimal fractions equivalent to the sequence of all possible fifths, the proper fractions 1/5, 2/5…5/5. It was Abulafia's kabalistic belief that symbolic, (algebraic), operations in (geometric) spaces can unify the "upper" and "lower" worlds in the eternal tensions between the body and soul, the inner world and the cosmos, the conflict making the global system both sensitive and stable. The geometric-topological approach to

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modern dynamical system's theory describes a convolution of the expansive motions (as in the upper world) and contractive motions (as in the lower world) embedded naturally in the curved time and space geometries of what are called *hyperbolic spaces.* Each point in this space can be visualized as a little saddle in which orbital flows from pommel and back flow down to the seat, bringing points together in contracting motion, and flows away from seat down along the sides are expanding the distance between nearby points.. In the middle of the saddle, simultaneously expansive and contracting orbits demonstrate *hyperbolic stability* composed of intersecting destabilizing and stabilizing influences. Loss of this countervailing *hyperbolic dynamical stability* results in global system transformations called *bifurcations* and/or *phase transitions*.

Transformation as a loss of stability is a theme of a recent poetic translation of portions of the *Zohar* called *Dreams of Being Eaten Alive* by David Rosenberg. He writes that at some time in the difficult journey through the often-incomprehensible *Zohar*, in order to gain entrance to the kabalistic cosmos, there arose what he called "heartbreak." "No matter how much intellectual study is involved, the reader cannot understand the text unless he or she has offered his heart to be broken on the altar of poetry…and prayer." Surrender may be the source of the strange, uplifting feeling of worked through dumbness.

My mother, once a conservatory teaching assistant in piano, sat beside me while I practiced almost daily, weekends included, from the age of two until the midteens. Her quiet analytic counter-point sounded mathematical, "You can hear that that this harmonic progression goes through intervals of fourths of dominant seventh chords." I felt the persistent lack of harmonic resolution as growing tension in my groin. "If you transform each of the 12 notes in a chromatic scale, multiplying it by five (in what mathematicians call) *mod 12* (the numbering system goes from one to twelve, not ten, before it repeats), one can recover the circle of fourths, the commonest harmonic chord progression in music." Though her computational talk supported rational thought, in my adolescent heat, the addition of Charley Parker's flatted fifth and ninth to the dominant seventh chord led suddenly somewhere else and she knew it. Hearing my arrangement of a Beethoven piano piece become a

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mix of classical and modern jazz themes that I called "How High the Moonlight Sonata," she laughed lasciviously as though tickled by this sensual violation of musical canon. A boogie-woogie Bach two and three-part invention brought more excited disapproval.

Mysterious are the conditions of attentive (preoccupied) and none attentive, (fugued out) disappearing time. I found a musical way for it to happen when improvising: continue to shuffle a small set of notes that stay within the melodic field of the tonal center of an unchanging tonic chord. In contrast, most melodies and their chords leave the tonal center to which they return in harmonic and melodic progression. We can call these conventional tonal centers *unstable fixed points*. They are *attractive repellers* of melodic and harmonic expectation. It has been mathematically proven that these hyperbolic systems are globally stable. In contrast, a melody that remains stuck in the tonic chord, a purely contracting *stable fixed point*, is technically a *chant*. Paradoxically, it can be shown that this kind of fixed point is globally unstable. Rigid things can more easily fracture. The rich, altered states of consciousness that emerge while hearing the beat of Tibetan monks meditating, the Sufi chant-dances of Rumi and the John Coltrane and McCoy Tyner's endless, single chord, tenor/piano dialogues exemplify the bifurcation to hallucinatory new stuff arising spontaneously from the experience of unchanging repetition. Constant repetition of the conditioned (expected) stimulus drove Pavlov's dogs, especially those with "nervous temperaments," into frozen, catatonic states. Abulafia's 1280 book on ecstatic techniques, *Hayyei Ha'Olam HaBa*, recommended the recitative rearranging of a finite set of Hebrew letters, frontward and backward, many times, using prayer melodies, until "…the heart will suddenly become aware of the intellectual, divine and prophetic…" and *hitbodedut* will rest upon him. The instructions were "…combine letters (and associated musical notes)… reversing and rolling them around rapidly until one's heart begins to feel warm."

It was in my freshman year at Stanford University when I met Michael Murphy, later to co-found Esalon, the California center for mystical pursuits and naked mud bathing. He is the author of *Golf in the Magic Kingdom* and with George

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Leonard, *Integral Transformative Practice*. I watched him go through a dramatic personal transformation after participating in Professor of Asian Studies, Frederick Spiegelberg's seminar (with meditation lab) about Sri Arubindo's interpretation of the Hindu Bible, the Bhagavad-Gita. Shortly after the semester, he climbed into an abandoned tower on campus to continue his meditation. He remained there for several months, refusing to come down even after the Stanford Student Health Service sent a medical school psychiatrist to investigate. I was more than curious about how it was that this hard drinking, and like his brother Dennis, all night poker playing, Phi Gamma Delta party boy, had suddenly become a transcendent ascetic.

My girl friend Mary and I signed up for Spiegelberg's seminar in Indian Religions. We were made breathless by his accounts of administering a Rorschach Test to the Indian Saint, Swami Sivananda. He recounted discussions about God with the artists Paul Klee and Max Ernst and the philosophers Rudolph Otto, Paul Tillich, Martin Heidegger and Martin Buber. As homework, Mary and I practiced breathing awareness mediation twice a day. During the year, Spiegelberg sponsored a visit by the aging but still very lively Aldous Huxley to our seminar. He also brought us Alan Watts and several lecturers from the Jung Institute of San Francisco. Shortly after hearing Huxley talk about the spiritual power of a particular exercise of will and loving thoughts, Mary and I began the daily practice of *karessa*, some call it *coitus reservatus*. I was eighteen and she was nineteen. We found that withholding an orgasm in order to achieve *nirvanic extinction of all desires and passions* was difficult. We spent hours in karessa meditation, trying to experience the detachment described in the Bhagadvad Gita. This biblical explication of *karma yoga* told how it was that the warrior, Ardjuna, instructed by God Krishna in the form of his charioteer, was able to detach sufficiently to do his assigned job of killing without emotional involvement. Ken Wilbur, a modern, self proclaimed *pandit*, an academically oriented articulator and intellectual justifier of the dharma, the spiritual work of Hindu and Buddhist practice, contrasts the nirvana (literally "end") composed of emptiness in time and space, *dharma Kaya* in which "...no objects are arising..." with the lesson of the Bhagavad-Gita. Its message involved realizing

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ones spiritual unfolding within the stream of real time and space, finding emptiness in the world of form and inaction in the world of action.

We worked at karessa so ardently that there was barely enough time left to do our assignments in biology and chemistry. In a darkened room, Mary and I lay legs locked, lying on our sides, moving slowly and rhythmically, humming *Om* and waiting for our ascension. We worked at making the journey through Sri Aurobindo's soul planes of *higher mind*, *illumined mind*, *infinitive mind*, *over mind* and finally, the *supermind* of *infinitely empty no mind*. This somewhat unusual way to study for a three credit course in Asian Studies at Stanford grew naturally out of the central message of Spiegelberg's seminar that whereas "...deriving a universal theology is not possible, having the *universal experience* is required for an understanding of any of the world's theologies." The controversial Bishop of the Episcopal Diocese of Newark who teaches that Christian forms continue to evolve, John Shelby Spong, D.D. says, "...every biblical word represents an attempt on the part of our ancestors in faith to make sense out of a God experience *in their time and place. The experience ...is eternal and real. The explanations will never be eternal and real. They will last only as long as the* (*cultural*) *mind-set that created them.*"

Mary got an A+ grade, topping Spiegelberg's class with a final examination essay, which, in literary detail, described her episodes of *samadhi,* yoga's state of unity with the creator. Her 25 page blue book contained accounts of walking fugues, spontaneously strong genital sensations, changes in tastes and smells, sudden feelings of rising spinal-abdominal kundalini, middle of the night dreams of oceanic orgasmic fusion with God. She failed to mention that she was describing her usual pre-menstrual state.

During these college years, I learned about two Isaac Newtons The first I met at elementary physics lectures; the unit was about how things worked called *mechanics.* Logically and computationally consistent but taken on faith, I learned about an invisible *field force* between masses called gravity that decayed in strength like the inverse of the square of their distances apart and operated in my intuitive world like an electromagnetic spirit. Less occult were the expressions of gravitational fields as *contact forces*, computed for the tension in the string of a

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pendulum or the pressure of the floor on a weight resting upon it. Faith in this realm came from exercises in physical object visualization followed by manipulation of self-consistent algebraic symbols. I learned about experiments attesting to the "reality" of these ghostly fields (that now include electric, magnetic and strong and weak nuclear forces), and yet it was the physicists that already believed them who designed the machines to demonstrate them. It was Gregory Bateson, Margaret Mead's houseboy, lover, photographer and social anthropologist who said, "Newton didn't discover gravity, he invented it."

One college summer I found a second Isaac Newton, perhaps not so estranged from the first. He appeared in the form of a marble bust in the chapel of Trinity College at Cambridge University, holding the prism he had used to explore the polychromatic properties of light like a talisman. In his essay called *Newton, the Man*, the early 20th Century Cambridge Don and economic theorist, John Maynard Keynes, said that the Newton of the chapel followed "...certain mystic clues which God had laid about the world to allow a sort of philosopher's treasure hunt to the esoteric brotherhood." Michael White's biography, called *Newton the Last Sorcerer*, described his work as an attempt to integrate the magic of the Old World with the science of the New Age. Newton's awe over what he saw as the wonders of the universe maintained him in private theological study throughout his life. Arthur Waite's *Alchemists Through the Ages* describes how Newton's alchemical orientation toward the earth's fundamental substances such as fire, air, wind and water, their powers and potential for transformation, was joined imperceptibly with his metaphysics and physics. In his hands, experimental observations involving gravitation, celestial mechanics and optics, though motivated by esoteric alchemical theories, generated experimentally accessible phenomena and testable ideas.

The French mathematician, Jacque Hadamard, in his *The Psychology of Invention in the Mathematical Field*, said that mystical preoccupations were never far from the minds of most of the English and European mathematicians and physicists of the 18th and 19th Centuries. This orientation served as an impetus for them to pay attention to the almost imperceptible whispers of their emergent thoughts. E.T. Bell, the historian of mathematics and mathematicians said even

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Descartes, the essential Enlightenment rationalist, was responsive to his "...call of the Spirit..." Napier the inventor of logarithms wrote an exegetical commentary on the Book of Revelations. The mathematician and physicist, Pascal, believing that contact with a religious relic had cured his terminally ill sister, wrote long tracks about whether or not the Devil could work miracles. The great mathematician, Cauchy, was known for his persistent efforts to convert fellow mathematicians to Roman Catholicism. Gauss, who was not particularly religious, said that a difficult to prove theorem did not result from hard work but "...the grace of God." In letters between Liebniz, who along with Newton was the inventor of calculus, and a member of the family of great mathematicians, John Bernoulli, used scriptural quotations and biblical diagrams as part of their theoretical correspondence. Perhaps the greatest mathematician of the 18th Century (or ever), Euler, in his *Letters to a German Princess*, discussed the functional characteristics of spirits and the connections between body and soul. Bell said Euler "...never discarded a particle of his Calvinist faith."

It was to the working out of a law of mechanics called "the principle of least action" that Ernst Mach attributed the beginning of the separation of physical mechanics from formal theology. The flavor of this change is captured in his 1893 *The Science of Mechanics* that stimulated Bridgeman's 1936 more formal philosophical analyses of physical theory, from a position that came to be called operationalism: the restriction of physical concepts to those definable in terms of the experimental operations required to demonstrate or prove them. Mach said that these events marked the move of formal metaphysical thinking about mechanics and the physical sciences more generally into the personal and private realm of belief and meaning.

Maupertuis, an eccentric friend of Frederick the Great and president of the Berlin Academy, proposed the principle of least action as evidence of the infinite wisdom of the Creator. As an early psychopharmacologist, Maupertuis recommended the use of opium to facilitate creative thought and was famously parodied for doing so by Voltaire in his 1752 story in which he is portrayed as the naïvely foolish Dr. Akakia. The physical law of least action belongs to a set of ideas

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that are called *variational analysis.* They involve the natural (or miraculous) selection of maxima or minima in quantifiable physical processes. Of all possible two-dimensional shapes with the same perimeter, the circle contains the greatest area; in three dimensions, it's the sphere. In his *Principia*, Newton reports his work determining the optimal shape of round solids, with circles of revolution having the same effective cross section, in order to minimize frictional resistance to gravity in a medium.

The *principle of least action* says that imparting energy; say by a kick, to a physical body on a rigid two-dimensional surface like the earth, results in it taking the shortest route possible from its initial to final position. The related 1650 Fermat's "principle of least time" is about light. As Feynman explains in his *Lectures in Physics*, "...out of all possible paths that light might take from one point another, light takes the path that requires the shortest time." Feynman, using elementary relations from high school geometry, proved that the *least time principle* could lead directly to Snell's law of the refraction of light at the interface of two different conducting media such as air and water. His analogy was the optimal choice of the path to take in order to rescue a pretty girl drowning in the ocean. Whereas the shortest distance to the girl leads directly into the water, faster running along the beach to the point that minimizes the distance required for the intrinsically slower rate of swimming increases the distance traveled but reduces the time required to reach her.

Euler attributed the optimization principle to an expression of the meaning and purpose of a loving God. Infused with this spirit, he developed mathematical methods describing smooth variations in position of an object in motion, the Euler differential equation, in which differential coefficients are varied to prove the principle of least action for mechanical motion. He gave the law Maupertuis's name. Mach quoted Euler's conclusion, "As the construction of the universe is the most perfect possible, being the handiwork of an all-wise Maker, nothing can be met with in the world in which some maximal or minimal property is not displayed." Such faith based mathematical formalisms were rejected by Joseph Lagrange, an early 19th Century mathematician, who, among many other things, proved that every natural

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number could be expressed as the sum of at most four squared numbers. It was his strongly held opinion that metaphysical speculation was both foreign and inimical to the conduct of mathematics and science. His work in the *calculus of variations* led to the development of a system of algebraic manipulations seeking the value of constants, Lagrange multipliers, in place of solving Euler's differential equations. It makes it possible to immediately write down a computable expression for the maximum of a mathematical equation. The technique is now routinely taught to high school students and with no mention of the role of belief in the perfection of God in its discovery.

* * *

I was a fortunate freshman medical student. After a visit to his office and a stimulating discussion about some of the correspondences between the ideas of psychoanalysis and neurobiology, Robert Heath, Tulane Medical School's Gary Cooper-like charismatic chairman of the psychiatry department, offered me a place in his animal and human neurophysiological laboratory. Between classes, evenings and weekends, I used a Horsely-Clarke apparatus, one of the world's first stereotaxic devices. It allowed the precise placement of electrodes into functionally specific regions of a cat's brain. The electrodes were cemented to the skull in place and their wires connected to a device by which the frequency, amplitude and wave shape of the electrical stimulation could be oscilloscopically monitored and electronically controlled as the conscious cat walked around the room. I spent hours observing and recording changes in spontaneous behavior that followed activation of various nuclei in the cat's brain with small electrical currents.

Deep in the part of brain that resides in the upper neck, called the lower brain stem, the region thought to regulate functions such as breathing, heart rate, blood pressure, gastrointestinal motility and global states of consciousness such as wakefulness and sleep, I found stimulus sites that, after 15 seconds of electrical activation, led to several minutes of hissing and objectless rage. One cat attacked an empty chair. These regions when activated also inhibited spinal reflexes such as

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the knee jerk of the standard neurological examination. Such phenomena were already well known in the late 1930's in what W.R. Hess and later John Flynn, following electrical stimulation of cats in the lateral hypothalamus, called "hypothalamic rage." In the late 1940's and 1950's, work by National Institutes of Mental Health's Paul MacLean attributed it to the actions of parts of the emotional "limbic" brain, particularly the fear-rage-attack coloring of experience by the temporal lobe's amygdaloid nucleus. Modern imaging studies in man have shown that this source of emotional coloring is activated by new information, even before the more rational parts of the neocortical brain processes it. How we feel about something new arises before what we think about it. These survival-oriented states of fight or flight are known to be biologically universal and demonstrable in even single cell organisms.

A greater contribution to my brain metaphysics followed observations that after several seconds of stimulation of other brain stem sites, the cats became alert but quiet, staring into space for several minutes. Then, they circled slowly and curled up on the ground. This was followed by several minutes of grooming and loud purring. Difficult to handle cats became transiently tame, some coming close for petting. I found that these same sites also increased the amplitude and reduced the threshold for the cat's knee jerk reflex. Responsiveness increased with calmness. Particularly interesting was the finding that electrical induction of this purring state could immediately stop on-going stimulation-induced episodes of hissing rage. I referred to these experiments with my friends as my neurophysiological studies of Old Testament vengeance and New Testament forgiveness. It seemed that the hissing rage would produce eye for an eye and a tooth for a tooth hypertension, the talon principle of the Old Testament and Koran. New Testament forgiveness would yield low blood pressure health and Jesus was a healer. It was about this time in the early 1950's that Northwestern University social psychologist, Jim Olds, found that rats could be trained to push levers to obtain current delivery via electrodes in various parts of their brains. Shortly after, Joseph Brady, then of the Walter Reed Army Institute of Research, showed that squirrel monkeys would do the same. With depth electrodes attached to wires running to a

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miniaturized electronics box strapped to their belts, some of Robert Heath's schizophrenic patients spent hours pressing their switches with beatifically expectant smiles.

It was after several months of cat experiments that Professor Heath suggested that we spend some time interviewing a hospitalized, chronically ill female patient, Donna, before and during the time she was being studied with recording and stimulating depth electrodes in the human neurophysiology laboratory. Donna, bony thin in a lose fitting green hospital gown and sandals, had dark red toenails, blonde hair and eyes shadowed darkly. In her mid-thirties, she had never married and, when she could, worked as a beautician. She told us that since her menarche at 13, she increasingly often had episodes of spontaneous ecstatic rushes along with sudden visions of strong white light. She attributed these experiences to visitations of "...an unseen Christ." She showed me a stack of notebooks filled with hand written accounts of her religious experiences interspersed with biblical quotations and difficult to follow discussions of what she called the Christian ideals underlying the Civil War. She read parts of it to us. One of her memorable stories was about being invited to a Children's Crusade that had begun in Georgia, led by a great grandson of Stonewall Jackson. "We were trying to find the Lord to see if He would part the waters and open up an escape route from General Sherman's march to the sea."

From a relatively poor family of Southern Baptists in rural Louisiana, she had lived in a state psychiatric hospital for almost three years. Her diagnoses ranged from borderline schizophrenia to temporal lobe epilepsy. The collateral interviews with her mother from several years before had been placed in the hospital chart. They recounted that in the patient's middle to late teens she had become suddenly promiscuous, frequently approaching strange men in city parks. Obsessed with fellatio and swallowing sperm, she told her mother that she was receiving a holy sacrament. More recently, the increasing incidence of ecstatic episodes and compulsive note taking coincided with the complete loss of interest in sexuality in any form. Her talk was now full of moralizing detail about the shoulds and should nots of daily living. She referred to herself as a non-Catholic nun who was married

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to Christ. The brain waves recorded from electrodes deep in her brain demonstrated transient episodes of spiking in a midline limbic structure called the *septum* and in the right *hippocampus*, deep in the *temporal lobe*. Paul MacLean and others since have shown that electrical stimulation of these and related brain regions could produce pleasure and grooming reactions in cats and prolonged penile erections in squirrel monkeys.

Many years later, I spoke about Donna with the Harvard professor of neurology, Norman Geschwind. He took me to his twice a week epilepsy clinic. In an effort to demonstrate what is now known as the Geschwind Syndromes of between seizure, *inter-ictal personality changes* in patients with temporal lobe epilepsy, he stood in front of the patients' waiting room. In a loud voice, he asked that all people keeping diaries and personal notebooks please stand up. Several did so, some displaying their notebooks in outstretched hands. The pages that I saw were filled mostly with religious writing, biblical quotations and exclamation points. Gathering the positive responders together, he asked them in turn what religion they were. Several answered the question with the question, "When?" It turned out that many reported having several experiences of religious conversion. Geschwind called them "Jamesian Episodes" after William James' *Varieties of Religious Experience*. He then asked when was the last time they engaged in sexual activity. For most of them, including those that were married, it had been years. Thought the men said they were not impotent, experiencing early morning spontaneous erections, they claimed a complete loss of interest in sex though feeling warmly affectionate toward people generally. As he anticipated, the patients were emotionally intense and unstoppably loquacious, needing to speak at length about their moral philosophies. They persisted in following us around the clinic waiting room, several speaking at once. In his lectures and papers, Geschwind called this last feature, difficulty in separation, interpersonal "stickiness." First reported by the French electroencephalographer, Henri Gastaut, a history of multiple ecstatic religious experiences, increasing emotional intensity and lability, hyposexualilty (not impotence), moralizing religiosity, compulsive and frequently poetic writing and tendency to cling to people is now called the Geschwind Syndrome of temporal lobe

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epilepsy. Some say it is relevant to the likes of Apostle Paul, Sister Teresa and Joan of Arc.

One evening in the human neurophysiology laboratory, I was invited by Dr. Heath to join him and several other brain scientists behind a two-way mirror to watch an interview with Donna while electrical current was being put through her recording electrodes. We watched and listened as a psychiatrist interviewed her about her past. The patient was speaking about her childhood. Unseen by the patient, the neurophysiologist, with us behind the mirror, was intermittently pushing the button evoking brain stimulation with very low current applied to the septum. Dr. Heath told me to listen for subtle changes or discontinuities in the flow of the on-going conversation that he said might reflect alterations in her thoughts and feelings. .

"The first time we were allowed to take a break from Sunday school for the church service and I got to hear the choir and the pipe organ, I suddenly got a feeling of happiness that I hoped would last forever. My Sunday school teacher told us how much Jesus loved us and that's what the music made me feel like. For the first time in my life I felt completely safe." Though the two way mirror I saw the psychiatrist nod silently. "When I learned about the real meaning of Christmas and Easter, it was frightening and beautiful."

Within a few seconds after the neurophysiologist, behind the mirror and unseen by the patient or her interviewing physician, pushed the switch on the stimulus generator, the patient stopped talking. After a little more silence, her interviewer encouraged her to continue,

"You were talking about how beautiful the holidays were. Tell me in what ways?"

"I don't want to talk about that anymore." She blushed and looked very uncomfortable. The neurophysiologist's hand remained on the switch. She continued to speak with her psychiatrist.

"I have to ask you a favor and I don't know why. I hope you don't get upset. The thought won't leave me alone." She seemed embarrassed even as her body relaxed against the back of the chair languorously.

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"Of course not, Donna. You know that with me you can say anything."

Her face reddening further, she stuttered something unintelligibly and then was silent.

"Pardon me, Donna, I didn't hear what you said."

"Would you mind if I rested my legs on your shoulders?"

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CHAPTER 2:

DOESN'T EVERYBODY

Varieties of religious experience and the potential they bring for personal change are embedded in and perturbative of our unique and common personalities. The *obsessive compulsive* may have an easier time with the rigid restrictions of Fundamentalism or be more resistant to the flagrancy of none rational mystical experience. The *hysteric* may find subjective evidence for the Holy Ghost more accessible and rules of behavior beside the point. The potential for double-jointed multiplicity in personal styles and quick transitions between them characterize what is called the *borderline personality*. It is in these ways that temporary and permanent brain styles in us and important others supply much of the ground for the possibility of spiritual transformation and the often attendant alterations in personality. How can we think about this facilitator and source of resistance to new spiritual practice?

A skinny, knobby kneed, small breasted, mousy haired, bright-eyed psychotherapy patient of mine at UCLA's Neuropsychiatric Institute Outpatient Clinic was among the highest priced Santa Monica call girls serving Beverly Hills. Answering my unaskable question about her thousand-dollar fee, she explained that she was living proof that, in her profession, what was more important than physical beauty was "griv sense." She explained that by her middle twenties, she had

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developed the ability to anticipate the most highly prized but often embarrassing-to-say longing for a particular sexual act without being asked. She told me that she had to "empty out my personal sex manual" to feel the cravings of her clients. What the *john* most wanted appeared suddenly in her mind in the form of a cartoon. A university criminologist later explained that the word "griv" was probably derived from what pick pockets call *grift sense*, the ability to intuit who was likely to have enough money in their billfold to justify the risk, even if they appeared in the worn clothes and dated cars of old money.

In his 1913 Dernieres Penses, Henri Poincare', France's seminal theorist in nonlinear dynamical systems theory, described intuition as a mental faculty which allows us to "...immediately see the end from afar..." In the context of mathematical epistemology, the instantaneous images of a geometer contrast with the labored sequential logic of the mathematical analyst. Poincare' claimed that inclinations toward one or the other of these two cognitive styles and their associated mathematical tools arise from different kinds of minds. He contrasted the 19th Century German mathematicians, Weierstrass, who he said reduced his general theory of functions to "...a prolongation of arithmetic...without a single (pictorial) figure in any of his books..." with Riemann who called geometry to his aid in describing functions. He created "...an image that no one can forget... once he understood it."

Experiencing the behavior of others, we create a set of anticipations about whom and how they are that align with parts of ourselves. Aware of one aspect of a person, we imagine the others. With a small amount of initial information, we connect the dots, fitting features we have seen and heard to personality configurations stored by informal category in our brain files. Our conclusions about them "being one of those" can both facilitate and impair our perceptions. Eastern metaphysicians, Western mystical religionists, socially liberal secular humanists, Shannon information theorists and today's students of dynamical systems in brain and behavior can, in different ways, make the case that the content of these stereotypes reflect a pattern of constraints, our personal limitations resulting from the rutted roads of worldly experiences. Baba Muktananda, the Hindi Saint from the

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Indian village of Ganeshpuri, called them our *samsara.* These limit the formlessness of anticipation that underlies sensibility. Our *samsara* reduces the uncertainty that could serve as grounds for new perceptions and understanding of others. Pre-emptive distortions reduce the bandwidth available for new information. They impair the range of empathic relations with others as well as ourselves. These restrictions in possibilities and choices are expressed in enduring patterns of behavior, thinking and feeling that mental health practitioners call *personality* and *character*. When confronted with these constrictions, the self justifying and diagnostically revealing thought about a feature of one's personality is, "...doesn't everybody? " This pride in our shape contrasts with the teachings about emptiness of one of Baba's favorite Indian holy men, Zipruanna, who sat all day, loin clothed naked in a garbage dump, instructing his students and followers about knowing and being nothing.

We quantitate deficiencies in formlessness using statistical measures of *entropy*. They characterize the system's behavior as a distance from the state of *highest entropy* also known as *maximal randomness*. Professor Karen Selz of Emory University did a study in which her human subjects, after taking a battery of personality inventories, were asked to remove as many dots as possible from a computer screen full of them in three minutes. They were to do so by left clicking on each of them with the mouse key. Two seconds after a dot was removed, it reappeared and became subject to removal again. As they went about the dot removal task and unbeknown to the subjects, the orbit inscribed by their dot removing mouse travels was recorded for later graphic representation and quantification. Most subjects with the usual broad mixture of personality traits inscribed a wide variety of orbital line styles: little wiggles, big wiggles, large and small loops, little smooth slides and big and little jumps. The counter-intuitive coupling of stylistic rigidity and whole system instability (as in non-hyperbolic fixed points described in the previous essay and below) is in evidence at the personality and graphical extremes of her subject group.

A fastidious, rigidly organized, severely *obsessive-compulsive* subject repeatedly removes the same dot, only occasionally moving to a neighboring one to do more repetitious left key mouse clicking. Very little of the large computer screen

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of possible mouse travels is occupied. All the action is centered on a small set of points. When such a *minimal entropy* person is injured and feeling helpless, their stuckness can grow bizarre. Ruminative fixation in self-critical and persecutory ideas extend into poisoned food anorexia, circular pacing, weight loss and middle-of-the-night, worried insomnia. Suffused with sin, they ask forgiveness for soiling the chair by their sitting in it or smelling up the room with their body odor.

At the *high entropic* extreme, the mouse orbits of the seductively dramatic, new reality-creating *hysteric* includes big jumps, disorganized whorls and large and small restless and short attention span scribbles that tend to fill up the entire screen. The fragility of fixation at this end manifests itself in breakdown into impulsively out-of-control and floridly dramatic displays. Their decrease in contact with reality precipitates social chaos around them. The Montreal behavioral neurologist, Pierre Flor-Henry, using electroencephalographic and psychological test data, described the difference between these two extreme forms of personality expressions as the overly dominant expressions of one or another of the *left obsessional* or *right hysteric hemispheric emotional styles*. As examples, Flor-Henry said that a left half brain depression feels like hopeless and agitated indecision and the depression of the right brain is an experience of emptiness like homesickness. Left-brain happiness is being exactly correct and right brain joy rushes like being especially chosen.

The church going obsessional resonates with the sermon of the punitive priest who invokes the tension and relief of sin and salvation. The practice can result in a life long addiction to the transient high of this temporary forgiveness. In other churches, the hysterical character gets spiritual respite in disassociative visitations of the Holy Ghost and attendant *signs and wonders*. At Wednesday night healing services, new hope arises from personal surrender in a floor hitting, backward collapse called *dying in the Lord*. Both of these antipodal personalities contrast with the more receptive state of *in-between entropy* (with enough entropy available to form messages) which predicts more flexibility and higher potential for undistorted information processing. Relatively style-less and ego-less people are more open to hearing a variety of Gods in themselves and others. High alertness

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without presupposition, ecstatically aware and selfless, it is God's gift realized, a joyfully awake and nonjudgmental empty state of transcendence. As we sit, we work at feeling this in the brain of the enigmatically smiling stone Buddha.

The externally inactive state of high internal activity, the Bhagavad-Gita's formlessness in the world of form, inaction in the world of action, has a natural mathematical representation in the simultaneously expanding and contracting motions of *hyperbolic dynamics* and its associated entropic descriptors. How can this kind of formlessness equip us for almost instantaneous knowing? In a resting state of *uniform hyperbolicity* that only looks like randomness, accurate impressions of others can arise quickly and from only a few data points of observation. In the late 1960's, University of California mathematician, Rufus Bowen, proved the now famous *shadow theorem.* This says that in dynamical states of *hyperbolicity*, directly observable on the screen in computer simulations, the first few points of the on-going wild dynamical dance that appears to jump randomly from here to there on the computer screen, counter-intuitively will quickly outline the entire skeleton of its future global shape, its geometry, though more time of observation is required to realize this structure in full detail. The contracting motions on the stable surface of action, called a *manifold,* "iron down" all the points onto the *unstable manifold* that serves to outline the shape of the *attractor* of all starting points. In such a system, observation of just the first few points outline the whole. Intuition, anticipatory knowing and that which some call prophesy, may be expressions of the hyperbolic brain's mind doing dynamical shadowing.

To review briefly, *hyperbolic brain flow* is made up of three decomposable components: (1) The apparently predictable one along the main road of the action, going straight ahead and round and round on a throughway called the *center manifold*—analogous perhaps to what might be a sequentially logical development; (2) Intersecting the center manifold transversally is a field of influence moving the action away from the center manifold with out-of-the-box motion, exploring side paths of unpredictably new, creative possibility called the *unstable manifold*, we might think about inspired risk-taking, impulsive associations in thought; (3) Another transversally intersecting field of influence, which conservatively, rationally, "irons

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down" the expansive flow back onto the road, the entire constrictive field called the *stable manifold.* This influence herds points into *shadowing* the main road of the dynamics, like the hair of the dog that stay close to the real body of the animal in motion. It is in this way that just a few often slightly off the mark points nonetheless shadow the real (called *fiduciary*) orbits of the attractor, outlining its global geometry with just a little information.

The intuitive reason *shadowing* works is built into these natural countervailing tendencies of *hyperbolic dynamics*, which on one hand tends to spread out nearby initial points and brings disparate others together. The latter inclination is the one that smoothes down the escaping points onto surfaces of actions that mathematicians call manifolds. However, the details of the orbital paths don't look that orderly due to the *mixing* of the sequence of points in hyperbolic motion. The mixing process on manifolds has been analogized to that of the bundled pink loops of the stretching (expanding) and folding (contracting) taffy puller at the carnival candy stand. The process gets sequences of small particles of candy out of sequential order while maintaining the taffy's overall geometrically ovoid shape. *Disorder is local* with the entropy being generated by the repeatedly *shuffling* of the line up of the original orbital sequence. This results in the impossibility of any point-to-point prediction for more than a few points even though the over all shape is maintained. Exactly what minute a habitually late sleeper awakes can't be predicted. On the other hand, the skeletal manifold of the global structure is entirely in evidence from almost the beginning. Late risers remain late risers even without a precise, minute-to-minute, predictable schedule.

It is also interesting that a uniformly hyperbolic dynamical system, unlike the *fixed-point attractors* of stylistic fixation, resist perturbation-induced changes in global dynamical form. In an apparent paradox worthy of metaphysical allusion, the dynamically hyperbolic kind of formlessness has *structural stability*. The global geometric predictability of this point-to-point, completely unpredictable system can be both the subject and object of Zen frustration and thoughtful meditation.

During weekly professorial rounds at Los Angeles's Neuropsychiatric Institute, I assigned a standard exercise for psychiatric residents on clinical rounds,

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which involved limiting their contact with a patient to five minutes. This was followed by detailed discussion of everything we'd seen and heard. I'd ask them to predict what we'd find in the many pages of personal interviews and nurses observations in the clinic chart. The student psychiatrists with the most street smarts, called *emotional intelligence* by Daniel Goleman, were particularly quick at shadowing and thus predicting the patient's global dynamical pattern.

Do personality patterns exist? Evidence from biometric studies of the hereditary aspects of personality style in animals and humans suggest that relatively few global component properties underlie a variety of complicated-looking manifestations of behavioral style. Primary colors are the source of all hues. Harvard psychologist, Jerome Hagen, has reviewed the history of this idea in his book, Galen's Prophecy. While there are differences among personality research programs, almost all rating scale and questionnaire-based studies result in clusters of traits that reflect statistically associated properties which when taken together are called *temperament*. This idea is close to what we mean by personality. These relatively few response clusters are given descriptive names such as *introversion*, *extroversion*, *neuroticism*, *impulsivity*, *sociability*, *task persistence* and *tolerance of ambiguity*. As defined by psychological inventories, studies of families show that these styles are heritable in the range of 60%.

Hans Eysenck, in over four decades of work and more than 5000 published papers from London's Maudsley Hospital, derived common global factors of personality using questionnaires. The best known was called the Eysenck Personality Inventory. His studies resulted in evidence for only a few fundamental behavioral axes, behavioral manifolds, which describe extremal properties of personality types analogous to stable and unstable manifolds: *introversion-extroversion*, *shyness-sociability*, *low and high activity level* and *emotional constriction versus impulsivity*.

To make the issue of personality as dynamical system more realistically complex, we can call on some examples of the rich history of behavioral genetic studies using animals such as the mouse. They can be selectively bred for underlying personality factors, such as dominance, fear, aggression or exploratory

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courage. Not surprisingly, social interactions, as configured by the mouse's own personality style, contributed significantly to their behavioral patterns. As an example, the C57BL strain of laboratory mouse has strong tendencies toward impulsively wild behavior. To be anthropocentric and using Hagen and Eysenck-like behavioral dimensions, we could describe the C57BL mouse as exhibiting high *psychotocism*, *P*, energetic sociability, high *energy*, *E*, and low emotionality, low *neuroticism*, *N*. The C57BL also loves alcohol and will dominate the low *E*, shy, low *P,* retiring, alcohol avoidant, high *N,* emotional, anxious, frequently defecating albino BALB strain of mouse when they are placed together for a limited time in a novel situation during the daylight hours. Over a more extended time, however, the BALB mouse comes to dominate the C57BL, beginning with attacks in the dark and finally as the persistent and patient survivor over days of aggressive fighting. BALB's low *E,* social fear eventually turns into rage and aggression. The C57BL is quick to mate and ejaculate but very slow to recover sexually, so that the less post-orgasmically refractory BALB also wins in long term sexual competition in a cage full of fecund females. Modern social psychological approaches to human personality are beginning to approach the interactions of genetic brain proclivities and collective social dynamics in this way.

Employing Eysenck categories of personality characteristics, similar results about style as influenced by genetic selection can be seen in humans. The correlations between factor scores based on B. Loehlen's studies using the California Personality Inventory in twins demonstrated as much as threefold higher correlations among identical twins for *extroversion* (*E*) and *neuroticism* (*N*) factors compared with matched fraternal twins. The primacy of some of the in-born biological roots of these personality styles is suggested by G. Methany's finding of higher correlations between identical as compared to fraternal twins when studied at the age of two months. The similarities in personality and temperament measures included *activity level*, *regularity*, *approach-withdrawal*, *intensity*, *persistence*, *distractibility* and *adaptability*.

More recent familial studies of the heritability of personality characteristics included *childhood shyness*, *neuroticism*, *depressive symptoms*, *aggressiveness*,

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behavioral inhibition and anxiety, *behavioral flexibility*, *narcissism*, *deviant motor activity levels*, *novelty seeking*, *harm avoidance* and *reward dependence*. These studies were conducted by R.R. Crowe, J.F. Rosenbaum, A. Methany, and J.L Robinson and indicated familial congruity of these characteristics among first and second degree relatives in the range of 40-50%. This level of heritability in genetically unrelated family members was found to be less than 20%.

Low entropy fixations of personality can also evolve developmentally. Experiments in young animals have shown that stress-induced high levels of adrenal hormones exaggerate the normal developmental process of trimming back unused neural connections, called *pruning*, the normally complexly over-grown *sprouting* pathways. The pruning actions of the *pituitary-adrenal stress hormones* come to dominate sprouting actions of *neural growth factors* and their protection of neuronal axonal branching and connections during development. The research program of Bruce McEwan of Rockefeller University and others document nerve cell loss resulting from the neurohormonal concomitants of stress. This reduction in neuronal connectivity and neuronal cell content has been conjectured to contribute to the *pathological simplification* of neuronal projections and neural network complexity, reducing information processing capabilities. The still intact machinery underlying the global patterns of neurological activity, such as those that underlie personality styles, is arranged around these pruned, unoccupiable holes of lost brain possibility. If this range of potential behavior is extremely reduced, the behavioral syndrome is often called a *personality disorder.* Those that have one are the predictable Johnny one notes of response to perturbation: thrash out, lie without reason, get drunk, binge on promiscuity, steal unneeded things from department stores, or withdraw into interpersonal isolation.

A more abstract and quantifiable way of representing the pathological simplification-induced emergence of low entropy, stereotypical personality style is inscribed on the head stone of the post-suicidal grave of Ludwig Boltzmann. This father of modern statistical physics expressed the idea in the form of a transformation: the (maximal) entropy, S, of a system is the *logarithm of the number,*Ω, *of its available ways of being*, (i.e., $S = \log \Omega$). That is, one way a

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reduction in the dynamical entropy of a system can occur is by reducing the number of its available states. As the repertoire of ways of personal responding, log Ω, is reduced, so is the brain system's entropy, *S*.

Reality constrained patterns of behavior, as in successfully adaptive personalities, lie in some optimal in-between place between the maximal and minimum measures of entropy. The dynamical state that is postulated to yield *in-between-valued entropies* is called *nonuniform hyperbolicity*. This is best seen when the values of the experimental observations are plotted in a two dimensional *phase space* with each point represented by two values: along the *x*-axis is plotted the value observed, along the *y*-axis is graphed the *change* in the value from the last observation. The signatory motions of these observations plotted in *phase space* are irregularly varying in rate of expansion (near by initial values are separating in time) and contraction (greatly differing initial values are coming together in time). Values are not fixed, rhythmically varying nor in random motion. These *nonuniformly hyperbolic motions* are seen in speeded up, talking head videos showing bursts of hand gestures and in normal neuronal activity. Silences have widely varying lengths and bursts of hand movements and neuronal discharges are irregular in duration and character. The statistical pattern of neuronal inter-burst intervals is not the convergent Gaussian distribution of I.Q. or heights but the nonconvergent, long tailed, Levy distribution of flood incidences and, according to Mandelbrot, stock market crashes.

The labored logic and inscrutably compact mathematical formalisms of the Nobel Prize winning physicist, Ilya Prigogine, and his Belgian school, explain the thermodynamics of these long lasting niches of restricted variation in our personal style as energy requiring *dissipative structures*. Compulsive nail biting, driven promiscuity, readiness to be suspicious are seen as a persistence of deviations from the maximum entropy of formless, flexible, receptive end states. The system is trapped in possibility reduced, *energy requiring*, *samsaric niches* of what Prigogine called *minimal entropy generation*. We unique and oddly shaped and entropy leaking balloons maintain our characteristic distortions through energy-requiring,

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persistent efforts at insufflation. The maintenance of neurotic defenses and eccentric habits can be fatiguing.

* * *

The children at Kids in Distress Residential and Day Care Center in Southeast Florida, called KIDS, tended to be small for their ages. As a psychiatric consultant to the Center, I often summarized an evaluation of both their physical and intellectual development as "delayed." Looking like almost completely formed adult-like personalities, however, they were developmentally "advanced." I heard in a child analytic seminar at the Psychoanalytic Institute of Southern California that traumatized children often hurry through the dangerous developmental ambiguity of openness and flexibility to the predictable, fixed attitudes and behavior of adults. It was common to find prematurely wise young children serving as parents in chaotically dysfunctional families. In residence at the Center, set free from their pathogenic homes by social workers and family law judges, these premature caregivers lost sleep worrying about who was taking up their obligations to the sisters and brothers left behind.

Trauma-induced possibility pruning was often obvious in the young refugees at Kids in Distress. Having been soaked in alcohol containing, nutritionally deficient, crack-laced amniotic fluid, young babies were then left in dirty cribs behind locked doors to cry themselves into exhausted despair. Their mothers were working the streets for drugs. The children that survived often demonstrate personality styles that are reduced in variety. They came to use a few, individualized, and stereotyped techniques for survival. Some children's insulated detachment was hollowly disguised as interpersonal caring. Others used driven and rigid compulsion to maintain the appearance of conscientious good citizenship. For some children, paranoid thoughts were realistic expectations. .

Arriving at the Center I heard "Dr. Arnold! Dr. Arnold!" in high-pitched screams. Several children ran up to me at once, demanding to be held. Some leaped into my arms for a hug. Trying to get and hold their visual gaze was another

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matter. Their eyes darted back and forth across my face, not stopping at my eyes, as though checking for danger. It felt like a strange mix of physical clinging and interpersonal distantiation. Many articles in the International University Press's Psychoanalytic Studies of the Child book series, described these prematurely formed child personality types: the paranoid scouts, the detached *as if* children pretending to feel, the desperate to please obsessionals, the charismatically seductive hysterics and the unconscionable psychopaths.

Experiments simulating trauma and neglect in young animals also demonstrate acceleration in biobehavioral development. Possibilities, the number of available states, Ω, brain entropies as $S = \log \Omega$, become casualties of traumatic and neglected early life. Like one trick ponies, these abused and abandoned children take up singular patterns of behavior that seem to work and stick to them. One doesn't anticipate seeing such narrowly fixated personality patterns until late adolescence or adulthood. They appear at ages too young to qualify for the character pathology coding of the Diagnostic and Statistical Manual IV. Yet the labels of adult personality disorder seem inescapable when one sees a four-year-old child trapped in a compulsive hand washing ritual or a panty flashing five-year-old girl with a seductive gait.

Four-year-old Alicia rubbed the lumps in my right hip pocket containing caramel candies. Her blue eyes twinkled. Her long blonde hair was in bangs and her lips in a pout. She kept a hand on her hip and tilted her pelvis as she spoke. Listening to children's stories, she straddled the reader's thigh and rocked. Alicia had a history of sexual abuse in a home that was a hang out for drug dealers. There were rumors that she talked to strange men late at night on the phone. On admission to the Center, she was found to have genital herpes. Both of her parents had been in and out of prison for drug-related crimes. The Center's staff spoke of Alicia's seductive smiles, incessant demands, irritable complaints and tantrums. With the back of her hand held against her forehead, she said that it was too hot to pick up the toys she had scattered around the fenced yard. Ordered to comply, Alicia took three steps into Florida's summer heat and fainted. Each morning, she spent the better part of an hour in front of the mirror, trying on all four of her dresses

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and their scarf and belt accessories before choosing one for her appearance at the breakfast table.

Five-year-old Grace was a suspicious and dictatorial presence in the Center's kindergarten class. Articulate and righteous, she confronted children and staff alike with evidence for the unfairness she found everywhere. In legalistic defense of her rights and sometimes those of her peers, she used her strong wide face, penetrating look and quick and observant mind aggressively. Her somewhat intimidated childcare worker maintained Grace's cornrowed hair with care. Sensitive to criticism and quick to anger, she competed with her teacher for control of the class. Her drug abusing young mother had escaped from her own mother's authoritarian house, leaving six-month-old Grace in the care of her commanding grandmother, a matronly church elder. Recent studies by David Reiss and associates at George Washington University assessed psychosocial dynamics in genetically varied families. They found that genetic similarities amplified the expression of individual characteristics of interpersonal relating through what might be called *personality resonance*. Relatives often commented that Grace and her grandmother, being alike, deserved one another. Shortly after her fourth birthday Grace was removed from her grandmother's home while the circumstances surrounding the accidental scalding of the bottom half of her body in an overheated bath were being investigated. She began her first conversation with me, "Hey doctor baldy, why are your bottom teeth so crooked?"

Damon was darkly handsome, with teasing eyes and a gleaming smile. Talking to his legal guardian on the pay phone in the afternoon of his second day at KIDS, he was heard to be making charges of mistreatment by the staff. He asked his guardian, loud enough to be heard throughout the day room, "What does it take to get someone fired around here?" Six years old and abandoned by his mother at the age of three, Damon came to KIDS with a history of provoking administrative conflicts at several children's shelters. His record showed that once he successfully used accusations of beatings to get a staff member fired employing charges that were later shown to have been fabricated. He argued persuasively, manufacturing events and quoting imaginary conversations with smooth confidence. He could

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change stories midstream without apparent loss of continuity or confidence. He learned the power of a claim of abuse, and used the threat of it to control his environment. Damon talked other children out of their candy allotments, cheated at games and stole clothes from other children's lockers.

Debbie, age eight, was the eldest of four children. Her mother was a street prostitute with an expensive drug habit. Debbie was thin, restless and worried. A self-appointed mother from the age of four, Debbie felt responsible for the care and feeding of her brother and two sisters. With a history of physical and sexual abuse by a series of her mother's boyfriend-pimps, Debbie spent most of her time cleaning and recleaning their small apartment and worrying about obtaining enough food for her brothers and sisters. Her mother was often gone for one or two days at a time, and food supplies were not dependable. On several occasions, Debbie was caught stealing food from all night grocers. The investigative social worker reported that Debbie had learned to sell oral sex to the men who loitered behind a neighborhood bar. She used the money to buy food. For several days after admission to the crisis home, Debbie was anxious and sleepless. She worried endlessly about the welfare of her sisters and brother despite reassurances that they were in caring foster homes. She checked on them as frequently as allowed by phone. In a playroom therapy session, wielding a rubber knife, she pointed to a scar on her left forearm and told a story about the time that she cut herself with a kitchen knife and fed her blood to her infant sister when there wasn't any food in the house. Debbie kept her room very tidy, did all her chores and sometimes those of other children. Even after several months in residence, always-busy Debbie didn't have even one close relationship with any of the other children or members of the staff.

Despite the superficial differences, there are subtle and pervasive similarities among the personality styles of Alicia, Grace, Damon and Debbie. Like overgrown and tasteless cabbages, pale and four feet across, growing from seeds over-treated with gibberellin or auxin plant hormones, the inner lives of these prematurely big little people are relatively empty of stable interpersonal objects. The pantheon of indwelling companions are either malignant, absent or both. There is a deficiency of internalized significant others with qualities we more healthy neurotics paste onto

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new faces which we then love and hate. Instead, every interpersonal arrangement is new, suspect and run on a cash-and-carry basis. We are made to feel like there are no seats for us inside of them. Even Debbie, with her history of selfless motherly devotion to her "children," felt like an empty husk, encased in the exoskeletal armor of compulsive correctness. With their inner life unpeopled, the best we on the outside can hope for is to be valuable to them as tools, like forks and chairs.

In new and potentially therapeutic settings, for example a genuinely loving foster family, these children manipulate, testing for the feared loss and abuse that first generated their detachment. They provoke the very mistrust they fear. The sexually exploited child is seductive. The physically abused child provokes attack. Personality constellations which can be adaptive, when narrowed and fixated, become impediments to new and reparative experience. It is in this way that personality disorders are self-maintaining.

An irony is that these interpersonally empty and rigid patterns in personality tend to occur in the most constitutionally robust of the abused and neglected children. They are those who have escaped early death from failure to thrive, severe neuropsychological impairment, chronic depression, severe social withdrawal or the pediatric psychotic disorders. The children with sufficient flexibility to adapt quickly and survive often settle into empty-centered rigid caricatures of adult personality styles.

Of course, well-defined and characteristic personality patterns do not require abandonment and abuse or the pathological simplification of traumatic deforestation of neuronal connectivities in order to emerge. Demanding social selection of particular personality proclivities that are competitively advantageous for highly sought positions also results in the appearance of well-defined personality styles. Common examples are the technical types, "techies," "nerds," whose work require long hours alone to master and execute, as in doing mathematical proofs, solving problems in theoretical physics, unraveling computer programming problems or writing highly technical tracks. These activities can be aided by the personality inclinations of shyness and distantiation, the experience of discomfort in social occasions along with a rich private fantasy life. Diagnostically oriented mental health

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professionals (and lonely mates) may label these interpersonally distant, engineering rocket science people, "high functioning" sufferers of *Asperger's autistic spectrum disorder*. Things going on inside get most of the attention, having more impelling importance than those on the outside involving other people. A recent study by Cambridge University's Autism Research Center compares the *empathizing* (*E*) versus *systemizing* (*S*) ability of normal controls and adults with Asperger Syndrome and find the quasi-autistic adults are *deficient in E* and *superior in S*. They call it the *E-S theory of autistic spectrum diseases*. Psychotherapists of these *autistic spectrum* personality types, patients who characteristically do not seek therapy but are forced into the office by marital or family conflict, speak of their long, patient and mighty struggles to make intimate contact with these clients. A more philosophical question involves issues of what are acceptable individual differences and why it is that these high functioning, highly paid and successful professionals have any diagnosis at all.

It is not surprising that the highest paid members of corporations producing technical products and services such as IBM and Oracle are those rare individuals in technical sales that are able to combine the skills and insights of introverted scientists and technicians with those of the gregariously successful salespersons. In business schools such a blend is seen in people who combine talents in both marketing and finance. In architecture this combination might take the form of a graphic-design artist with computational mechanical engineering skills. Recruiters know that it is difficult to find people for what is called *engineering sales*.

From all over the United States, professional instrumental musicians that began to experience severe technical difficulties that defied their teachers as well as more extended practice time came to see Chicago's music guru, Carl Boardstadt. He was a nationally known consultant to classical and jazz professionals in the 1920's and 30's. His particular specialty involved those who had "hit the wall," those whose progress toward advanced musical mastery and accession into the higher echelons of the business had been truncated. His recommendations were often eccentric indeed. For the wind musician with breadth control problems, it might be blowing uniform bubbles through a long tube held at increasing depths of a filled

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bathtub or feeling the seductively diaphragmatically oscillating belly of a taxi dancer. Pianists with speed problems worked at specially constructed up-side-down keyboards with the rationale being that finger lifting was more rate limiting than finger placing. He said that his most hopeless cases were those whose personalities didn't fit their choices of instrument, too often made by what position remained open in the high school band rather than following a personal interview. He claimed that trombonists should be sensually languorous; clarinetists, nervously impatient; double reed instrument players, obsessional and withdrawn; brass players, athletic and exhibitionistic.

* * *

As one of the team physicians of the San Diego Chargers in the years 1971-1975, I spent several days a week in their summer training camps, on the team plane to and from games, in the locker room and on the sidelines during games. I was involved particularly in player drafts. Unbeknown to candidate players and other teams, we used a system of what social scientists call *unobtrusive measures* of their personalities as part of their evaluations. College football players are sent questionnaires each year by professional teams asking about a variety of life events and attitudes including their goals for the future. Filled out by hand, they served as *repeated measure*, *handwriting samples*. Twenty years of them were available in the Charger's record room. Using 30 standard signs from the French graphology literature and three trained raters, we evaluated the hand writing characteristics of players, National Football League wide, who obtained and retained playing, not reserve, positions in the League for at least three years.

After studying handwriting profiles from close to a thousand established NFL players, and hundreds of hours of individual interviews of members of many teams, it became clear that, athletic abilities being equal, success was more likely when the player's personality type fit his football position. What amounts to a series of selective filters are operated by coaches, scouts and managers throughout the playing careers of these players in grammar schools, high schools, universities and,

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ultimately, the NFL draft. Choices obviously involved more than height, weight, time in the 40-yard dash and performance in motor coordination tasks. The players behavior, carefully studied on the field, in multiple camera angle game films, direct and collateral interviews and observations under game conditions constituted a high level of selective pressure that brought with it the emergence of characteristic personality types. Tens to hundreds of thousands of candidates are winnowed down to several hundred highly paid players in this selective process.

Distinctive personality patterns accompany success at a particular position. Structure loving, politically more conservative, choreographed in detail and repeatedly rehearsed, offensive players keep their lockers more organized and tidy. More rebellious, resentful of structure, politically more libertarian, thematically instructed but principally opportunistic, defensive players, particularly linemen and linebacker's lockers had messy lockers. Defensive team players were most often in trouble with the law. Offensive lineman including centers, guards, tackles and some tight ends tend to be patiently enduring and tenacious, their aggression taking the form of stubbornness. This contrasts with the temperamental explosiveness of the defensive line and linebackers. We could speak of the volubility of centers, the loyal and caring kindness of offensive tackles, the narcissistic exhibitionism of wide receivers, the murderous rage of the defensive end, the sullen and paranoid depressiveness of the defensive back, the joyfully impulsive unpredictability of broken field running backs and the good citizenship egolessness of the blocking fullback. Some quarterbacks lead and play fearlessly in a religious state of grace, some are members of the Fellowship of Christian Athletes. Others lead as fearlessly, but in the style of an unconscionably calm psychopathic bank robbing professional.

Influenced by our findings, the San Diego Chargers drafted the Hall of Fame quarterback and one time ABC Monday Night Football commentator, Dan Fouts. Skinny and hurt several times during his college years as a quarterback in Oregon, he was passed over in the NFL draft until the third round. The scouts "knock" on him was that they thought that he lacked psychological and physical toughness; the ability to get up after a hit and to ignore the on coming tons of defensive linemen

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while calmly and quickly surveying the routes of several potential receivers. The pattern found in his handwriting features, however, resembled those Johnnie Unitas, the Hall of Fame quarterback of the Baltimore (then) Colts who, in spite of his small size, famously played with great courage and physical toughness. In chronic and severe back pain, he played regularly until retirement in his early 40's. Fouts drafted in the third round with a small five-figure bonus, proved to be a great bargain for the Charger franchise.

Given the theoretically infinite number of ways that a personality can be, it is remarkable that the latest Diagnostic and Statistical Manual of the American Psychiatric Association, DMS-IV, describes only eight types, which form three subsets of exaggerated expressions of stable personality styles called personality disorders. All eight personality disorders can be grouped into: (1) *Cluster A - Odd and eccentric types*, whose anxiety is related to the felt threat of disintegration and annihilation of the self and whose style is dominated by mistrustful paranoia, a schizoid, detached and emotionally flat pattern or the isolated strange eccentricism of *schizotypal characters*; (2) *Cluster B - Unstable and impulsive types* whose anxiety is related to loss of the stable self and whose style is dominated by irresponsible antisocial behavior, chronic instability with high amplitude fluctuations in behavior called *borderline*, or patterns of excessive emotionality and dramatic display associated with *histrionic characters*; and (3) *Cluster C - Fearful types* whose anxiety is related to hypersensitivity to criticism, guilt and feelings of inadequacy or loss of control, and whose style is dominated by interpersonal avoidance, clinging dependency, or rigid lock up into obsessive-compulsive efforts to do the right thing and avoid disapproval. This remarkably small array of stylistically consistent global behaviors selected from a practically infinite number of imaginable possibilities establishes a small set of invariants of some, perhaps abstract, property. These characteristic patterns inspire our search for the implied brain and behavioral conservation laws that may underlie them.

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CHAPTER 3:

TRANSMOGRIFICATIONS OF ENERGIES

After several of months of running, 12 miles most days, I felt an energetically calm, self-containment and a growing loss of interest in things sexual. My increasingly impoverished fantasy life led my training psychoanalyst to suggest that I was running away from the critical, females issues of my psychoanalysis. He said I was becoming more out of reach as I became more socially pleasant. This was decades before Prozac, Paxil and other serotonin reuptake inhibitors were inducing similar hyposexual, withdrawn states of cordiality in millions of Americans. Recall that Norman Geschwind, the Harvard Professor of Neurology, reported similar conditions of high energy sexual disinterest and abstract metaphysical preoccupation in patients with right temporal lobe epilepsy. For reasons other than the loss of church property rights and the spread of syphilis to the clergy, it felt like I was being readied for Pope Gregory VII's Eleventh Century celibacy reforms for abbots and clerics of the Catholic Church.

It was true that my feelings of dependence on my analyst for understanding and approval were being reduced as I ran into less emotional involvement. I was becoming a more rationally objective observer of others and myself. It wasn't the first time that my over-ardent practice led to this warning. Baba Muktanada, my Hindi guru, told me to reduce my daily sitting time of meditation. He said my spacey

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social smile belied a growing disinterest in the welfare of others. I was getting hooked on the hard training high of not really being there for other people.

Several articles in *Runner's World* said that many runners become addicted after even a few months of running over six miles per day. It's true that over fifteen years I missed less than 10 days of running per year. I ran in driving rain, sweltering heat and dangerous places. In New York's Central Park after dark, I followed a freshly strewn trail of torn woman's garments that ended in shredded panties and a bra on the Park's bridle path. In Oklahoma City at 104,° I was chased and bitten by a terrier. In Munich at 4:30 AM, before delivering a morning lecture, the black uniformed police stopped me for a shakedown. In Ann Arbor, I shuffled along in two feet of snow. By the Seine, at 14°, paranoid barge hounds barked in big dog baritones. I ran on the Hebrew University track a block away from a loud Palestinian bomb left in a refrigerator near a busy street corner. Breathless at nine thousand feet in Aspen, gagging on the strong manure smell of Sacramento Valley farms, in the hot wetness of Houston and dry heat of Palm Springs. I wore out three to four pairs of Nike running shoes per year. What I did not tell my training analyst was that this felt like a chase after God. As in most spiritual transformations, His messages and music could emerge quite suddenly.

Even after stretching, it was painful to begin and that was my daily sacrifice. I was readying myself to follow the God of the Hebrews and make the "three days journey into the desert" as in Exodus and Paul's recommended presentation of my body "as a living sacrifice, holy and well pleasing to God." After three miles of running, the hip pain, back stiffness and leg heaviness lifted, difficult breathing became easier. A burst of new energy appeared suddenly. The first pop usually took the form of assertive feelings fueled by new personal power, an undoing of the lethargy and depression of a helpless sinner. New and big, I felt like I could fix almost anything. Up bubbled an aggressive speech to the Dean about his refusal of our recent request for an increase in departmental research space. As for the National Institute of Health's recent return of one of our grant proposals, it was now clear that the reviewers were wrong. I would resubmit but this time ask for twice the amount of money. I rehearsed a new list of necessary and routine laboratory chores

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for my most rebellious post-doctoral student. I would tell my teen-age son that he must wait another year for his own car. I felt generally intolerant.

In an article in *Runners World,* I labeled my run's first *global brain state transition*, the *first second wind.* It energized me with the cool firmness but ready-to-be angry righteousness of modern religious orthodoxy: Orthodox Jews gunning down Hamas terrorists as retribution for bus bombing children which was itself a retribution; Muslim suicide bombing as vengeance for cultural contamination; Catholic Bishops refusing the Eucharist to pro-choice politicians; Charismatic Christians gay bashing defense of the sanctity of marriage; Mohammed's early Sufi-like poetry of love turning into territorial aggression and Jew killing in his later years.

Once in while, unpredictably, past the first hour of running and after the first second wind, a fatigue easing second burst of energy followed the second stage of exhaustion. I called this running-induced, *second global brain state transition* to a softer loving energy, the *second second wind.* Colors became intense, clouds breathed and my body lightened. Running once again became easy. I was flooded with empathic and generous thoughts. I understood that the Dean was faced with too many space demands to satisfy; the grant reviewers' criticisms of the budget were meant to be constructive. I recalled that strong minded, rebellious post-doctoral students often made the most creative contributions to science. I realized that my son's urgent desire for his own car was a proposal in the direction of the independence that would be required of him the following year when he was going to be hundreds of miles away at a university. Filled with benign optimism, I felt the compassionate perspective afforded those with energy but without envy, anger or fear. William James, in *Varieties of Religious Experience*, A.C. Underwood's book, *Conversion, Christian and Non-Christian* and Gobi Krishna's *The Awakening of the Kundalini*, among many others before and since, describe the sudden appearance of long lasting states of optimistic energy and loving empathy that can emerge after long episodes of suffering, especially following periods of privation of spiritual meaning and the loss of a previously strong faith. These episodes are painfully chronicled by St. John of the Cross in his *Dark Night of the Soul.*

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In the long distance running model of spiritual transformation, the first energy appears suddenly in the middle of painful fatigue and feels like a vigorous implementation of Halachic commands or Canon Law. The second burst of energy emerges from readiness for resignation and ends in humane comprehension and empathy. In some Christian monastic practice, a similar transition is represented in the ritual of *Tenebrae* (or *Darkness*). Fifteen lit, unbleached candles are extinguished, one by one over the night, while reading the Psalms. The practice is said to represent the desertion of Christ by his disciples, as the church grows darker over the night. After the singing of the *Benedictus,* the one remaining light is quenched, plunging the church into total darkness. In *Myth and Ritual in Christianity*, Alan Watts suggests that the loss of the last light of *Tenebrae* induces the realization that "I am nothing." This reduction in egocentrism, along with a dark-piercing alertness is said to facilitate an invasion by a loving God that precipitates the fasting, sleep deprived and praying petitioners into long lasting ecstatic states.

These uses of *energy* and its attendant characteristics are not physically specifiable but rather hermeneutic of a force. It is both a potential and a realization, observed and inferred. It is the "energy stuff" of Freud's *libido*, Wilhelm Reich's *orgone energy*, Pavlov's *drive*, Rudolph Steiner's *etheric formative force,* the *arousal* and *attention* of brain wave and consciousness research, the *Ch'I* of Chinese medicine, the Hindu divine energy of *Shakti*, the Hebraic *ruach*, the Cabalist's *Yesod*, the Sufi's *Baraka*, the Christian *Holy Spirit*, the Yogic breath energy, *prana*, Mesmer's *animal magnetism*, Galvani's *life force*, Goethe's *Gestaltung*, Madam Blavatsky's *astral light*, Georg Groddeck's *it*, Henri Bergson's *elan vitale,* Schroedinger's *entropy*, Abraham Maslow, Ruth Benedict and Buckminister Fuller's *synergy*, Bertalanffy's *anamorphosis*, Colin Wilson's *x factor* and George De la Warr's *biomagnetism.* Of course, by nationality, culture and field of study, there are many more examples, each locally defined by its particular context and haunting with its promise of universality.

Energy in the context of mathematical physics is intuitional, abstract and relational. It is not created or destroyed, but rather transformed. Consistent with his deceptively simple style of physical intuition training of the young, Feynman's

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discussion of *thermodynamic energy* and its *conservation* in *Lectures in Physics* begins with the premise that it is a numerical quantity that does not change when one or many alterations in the system occurs. His heurism for energy and its conservation involves the premise that Dennis the Menace has 28 indivisible blocks, a number which his parents find constant at the end of every day of play. If one day a count yielded 27, an investigation would reveal that a block could be found elsewhere, say under the rug. If at the end of the day, the count was 29, the extra one had to come from somewhere else, perhaps Dennis's playmate Bruce. If Dennis locked some of his blocks in the toy box and threw some into a bathtub of dirty water and (1) A block weighed three ounces; (2) The box alone weighed 16 ounces; and (3) Each block raised the water level of 6 inches by one fourth of an inch, then this metaphoric energy relation can be expressed:

$$\text{(blocks seen)} + \frac{\text{(weight of box)-16 ounces}}{\text{3 ounces}} + \frac{\text{(height of water)-six inches}}{\text{1/4 inch}} = \text{constant} \quad (28)$$

Feynman notes that this representation of an energy relation, computed as a number of blocks, will always remain the same. If there were no blocks in sight, and one used this *energy conservation relation* with blocks as units of energy, we find no blocks as such in the expression at all.

The abstract and formal idea of energy in physics first arose in mechanics and was generalized to electrostatics and electrodynamics. If one idealizes these systems, eliminating real world factors such as friction, temperature gradients, temperature dependence of the properties of materials, viscosity, hysteresis and other nonlinear behavior, then the energy conservation law says that in an *isolated and interacting* set of systems, the sum of the energies of the several systems remains constant. If, on the other hand, a system interacts with its surroundings, *not isolated and interacting*, then the increase in the energy of the index system is equal to the *work done* on the system by its surrounds. Like pre-Enron bookkeeping of corporate cash flow and balancing ones personal checking account, energy, like money, does not disappear; it is only changed in expression. As in the context of currency equivalent value, energy can represent a very general quantity applicable to a wide array of specific objects and activities. The results of

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the early studies by Professor Seymore Kety of Harvard and Dr. Harold Himwich of the Thudicum Laboratory in Galesberg, Illinois, using measures of *whole brain oxygen and glucose utilization* as indices of energy generation and utilization by the brain, surprised many of us. They indicated that energy use by the *whole brain* was relatively constant when states of relaxed awakeness, mathematical cognition and deep sleep were compared. Of course, modern studies have indicated that relative *regional* brain energy utilization is state dependent and may vary quite widely.

More spiritual aspects of energies and their transformations were made clearer during several month visits to Baba Muktananda's, now Gurumayi Chidvilasananda's, Sidha Yoga Ashrams. Baba Muktananda loved and worshipped his Hindu Guru, Bhagawan Nityananda. Baba had been a restlessly wandering, guru-hunting, young man. Nityananda said he had "wheels for feet." After many years of devoted meditation, chanting and service, *sadhanna*, all the while being prohibited from eating mangos, his favorite food, his passive, taciturn, ecstatic guru, Nityananda, presented voluble, energetic, joyful Baba with the guru's rather aromatic and worn sandals. This symbolically acknowledged Baba's successful absorption of the guru's transforming spiritual energy, *shaktipat*, the power of his enlightenment.

At Nityananda death, Baba, using world tours, spiritual fellowship meetings, *satsangs* (public conversations) and spiritual training sessions called "intensives", organized Ashrams in West Coast sites such as Oakland and Venice, and on the East Coast, in South Fallsburg, New York, buying several old residence hotels in the Borscht Belt. Baba was introduced to America by one of his first advance men, *Be Here Now* Baba Ram Das, Timothy Leary's co-investigator in the Harvard Student LSD project when his name was Richard Alpert. *EST*'s Werner Erhard was another of Baba's advance men.

Baba discipled and disciplined a sister and brother who, when 18 and 11 respectively, were sent to live in his Ashram in Ganeshpuri India by their parents. The girl was known as Malti when she served as a translator for Baba and Gurumayi Chidvilasananda after receiving the energy of her enlightenment. The younger brother was given the name of Baba's guru, Nityananda. When Baba took

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a guru's ecstatic death, *Samadhi*, both Gurumayi and young Nityananda became co-gurus. Following three years of the usual covert power struggles of succession in organizations, Gurumayi took over the guru lineage of Siddha Yoga. Her lively brother's worldly preoccupations with jazz drumming and confessions of promiscuity led to his giving up of the orange robe of the denunciate, *sanyasi*, for the blue robe of worldliness, exchanging one kind of energy for another.

Brad Gooch who visited Gurumayi's Ashram in Ganeshpuri, India, wrote in his recent book, *Godtalk*, that she looks like a "synthesis of Indira Gandhi and Bianca Jagger." In what reads like a Hunter Thompson episode in an unwritten book called *Fear and Loathing Along the Guru Trail*, *Godtalk's* explication of Siddha Yoga was dominated by yellow journalistic rumors such as the one about Baba's use of a gynecologist's table with stirrups for non-ejaculatory *Tantric practice* with some female followers. This unconfirmed claim remains, as Gooch says, in the realm of "...he said, she said." Gooch's exploration almost ignores the deeper meanings of *Kashmir Shavism*, *Buddhism* and *Kundalini Yoga* that compose the philosophical foundations of Siddha Yoga. The importance of knowing, loving and becoming one with the God within trivializes all but ungenerous or hurtful interpersonal behavior. Even the tougher version of the Ten Commandments in Leviticus 19 would not necessarily disagree.

When a Los Angeles Times reporter tried to chide Baba about being driven about in his "worldly" Mercedes sedan, he explained that a very wealthy Indian merchant had given it to him and "...I have to put my behind somewhere." Similarly, why would Gooch's account of Baba's Tantric practice, even if true, ruin the imago of him in my mind unless I had already surrendered to the pantheon of good and evil absolutes of Judeo-Christian taboo? My knowledge of these non-materialistic meanings of apparent materialism began with one of the favorite finds of Baba's youthful days of guru hunting: Zipruanna, who, wearing only a loincloth spent all day, every day, on a stool in the middle of a garbage dump. Remarkable changes occurred in people who spent time there in his presence. Baba said the identity of guru was established by the results experienced by those that spent time in his presence. It could not be defined by the physical features or ritual conduct of the

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interaction. People become spiritually energized and change in Zipruanna's smelly, garbage-filled presence. I keep a picture of him on my desk.

Gooch, in his implicitly and superficially righteous preoccupation with what he considered disenfranchising human vulnerability, recalls how the medieval church used the difficult to impossible vow of chastity for political control of their priesthood. He seemed to have missed Baba's lessons about the remarkably simple sounding practices for mobilizing the energy of the God-receptive state. Once in this new state, the rest of the metaphysical work almost takes care of itself. I, like many others, adopted Baba's mantra, *Om Namah Shivaya*, "I worship the God within me (and you)" that he was given by his guru. The inner chant of this mantra brings me to an internal quiet in which things become clearer. Meditation, chanting and service to the guru was motivated by his promise that my egoistic concerns ranging from the number of publications on my *curriculum vitae,* to the size and adroitness of my penis, would *disappear autonomously in the Baba state of bliss.* This sounds very much like the role of the transition to an "active intellect." in Abraham Abulafia's 13th Century *Commentary on the Secrets*. Arduous study of the spiritually dense writings of Sri Aurobindo during the days with Professor Spiegelberg at Stanford gave me a peak into the simple but difficult to execute idea of "simply" becoming the transcendently comprehending state of *existence-consciousness-bliss.*

Whereas Baba would occasionally lapse into terse Sanskrit verse and its multiplicity of potential meanings, Gurumayi keeps things simple. Sitting silently and immobile at *satsang* for hours, she radiates transformational energy, *shakti*, that makes ruminations about human affairs seem unimportant. The work is about getting the self concerned head noise of ones preoccupations sufficiently out of the way to allow the discovery of the God who has been waiting patiently within. A fellow ashramite gave me a photograph of my first audience with Gurymayi. It showed me on my knees in front of her. She appears to be dismissing me with a baleful, almost disdainful look as my introducer, gesturing broadly, was, unasked, reciting a list of my professional bona fides. The picture caught her waving me off with a long, peacock-feathered stick. Obviously unimpressed, she is sending me back to my all night, every night, tent cleaning labors at the Ashram. Rich Indian

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businessmen, whose large donations were a major source of support of the Ashrams, faired little better. They seldom received a personal audience or favorable seating at *Darshan*, the evening public time of question and answers with the guru. In contrast with the relatively easy public availability, mischievous play, provocative humor and worldly sophistication of Baba, the ambience of Gurumayi is more private, simple, serious and subtle. It is as powerful, but in another way.

In response to Gurumayi's ascension to Siddha Yoga's singular guru, I imagined hearing Baba saying that God energy was at least androgynous, if the dimension of sexual identity was relevant at all. Baba taught that *divine energy,* by necessity, is expressed through a wide variety of particular personalities and cultures and should not be confused with the details of its manifestations. This included the sexual identity of the chosen Vehicle. Guramayi's central theme, as I understand it, concerns the simple, quiet and pervasive powers of love and faith. Some say Baba took the path, *marga,* of selfless action, *karma-marga*, whereas Gurumayi took the *bhakti-marga,* the road of loving devotion and faith. The third *marga* is *jnana-marga*, my inclination, is the road of intellectual study and knowledge. Aldous Huxley related the choice among these three categories of *yoga* practice, to the physical and personality types of William Sheldon's 1954 *Atlas of Man. Karma yoga* corresponded to the *mesomorphic* body type and the assertive boldness, high energy, and interpersonal callousness of the *somatotonic* personality. *Bhakti Yoga* was the characteristic choice of *endomorphic* body types with the *viscerotonic* personality traits of sociability, good will, tolerance and love. Huxley associated *Jnana Yoga* with *ectomorphic* body type and the *cerebrotonic* characteristic of shyness, sensitivity and intellectuality.

My summers with Baba at his temporary Ashram in Venice, California and the permanent American Ashram in South Fallsburg, New York, were spent in daily, very early morning, chanting of the *gurugita* after most of the night spent taking down, cleaning and putting up large tarpaulin meeting tents. I was assigned this simple, arduously manual, all night work after being interviewed and found out to be a professor and chairperson of a medical school department. Baba instructed his assignment committee that many if not all professorial egos would benefit from what

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Andrew Carnegie famously called the dignity of real work. Spicy one dish vegetarian meals, twice a day meditation and brief stolen naps consumed the rest of the day. I found myself meditating for longer and longer times, chasing the promised *Blue Pearl* that Baba said appeared behind the eyes near the supreme meditative end point.

Beside care with the titration of meditation-induced interpersonal disconnection, *detachment with love* is the desired end point of most Hindu and Buddhist meditative practice, another set of "side effects" of the energy arising early in the course of too much meditation is called *kriyas*, spontaneous episodes of involuntary behaviors and postures of the body such as unprovoked chanting and writhing and stereotyped hand positions called *mudras*. Baba told us one of his *kriyas* took the form of spontaneous erections that occurred during his first experiences with deep meditative states. I recall a woman physician and fellow ashramite in Los Angeles telling me that her panties often got so soaked during meditation that she worried about being stuck to her cushion. Beyond these initial somatic overflows of Divine Energy, *shakti*, emerges a vision of the *Blue Pearl*, *bindu*, Baba's "gift from the Goddess Kundalini." As he entered this stage, he said that his mind filled with "joyous contentment." Jewish mysticism of the 1300's acknowledged the neighborhood relations of Eros and the Sacred.

More formal and scientific uses of the word, *energy*, like all objects of thought embeddable in a mathematical context, are abstract and relational. In his book, *Mathematics-The Music of Reason, Jean Dieudonne'* treats *mathematical objects* as *objects of thought.* Dieudonne''s book documents the 19th Century transition from concrete, visualizable, classical mathematics to abstract, nonvisualizable relational ideas. This conceptual transition to abstract, relational thought objects that are no longer representable by pictures or accessible to our senses of mathematics and physics is yet to reach the concrete DNA-causal religionists of modern molecular biology. In 20th Century mathematics, Dieudonne' observes that "...the primary role in theory is played by the *relations* between mathematical objects concerned *rather than the nature of the objects themselves*...these relations are often the same for objects which appear to be very different and therefore they must

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be expressed in ways which do not take these appearances into account...and can be specialized at will..." DNA sequences are, as MIT molecular biologist, Eric Lander observed, nothing more than an elementary "...list of parts..." In fact, since about 1% of the nucleotides are relevant to functional genes, one might say that the important members of this list of parts are distributed very thinly among many more apparently unimportant ones. The next frontier will certainly involve an understanding of the dynamics of the interactions among elemental parts and in more abstract laws about molecular biological relations; a focus on the dynamics, not the structural parts, that regulate and control their expression.

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I made a pilgrimage to spend eighteen months within Rene' Thom's penumbra, living among mathematicians in his "ashram" in Bures sur Y'vette, France. Thom was one of the founders of the *Institute des Hautes D'Etudes*, *IHES*, *Institute for Advanced Scientific Studies,* created to stanch the flow of high-level scientific talent away from France after the Second World War. It is in Bures sur Y'vette, deep in a green forested valley, 50 or so miles South of Paris, in a building packed with small, thin walled, big windows-on-the-woods offices. Each office contained a single hard chair, an old office desk, two walls of blackboards and a box of white only chalk. The use of colored chalk was felt to be without mathematical rigor because its use substitutes colors as dimensional descriptors for more demanding abstract and formal representations. Color was cheating. Meditation in this ashram was practiced by staring, pacing, scribbling, and humming, mumbling, belching and farting through the Institute's thin office walls. The building, though almost completely occupied, was otherwise silent. The Institute was populated by such world-class mathematicians and theoretical physicists that once inside that building, I felt so intimidated that I almost never spoke above a whisper. Listening to excellent William Thurston's casual use of a tiled bathroom floor to motivate a unique partition of a topological space, I was attacked by the awe of an early morning visit to an almost empty Notre Dame Cathedral in Paris or standing in front of Michelangelo's radiant marble statue of Mary and Jesus the Infant in the Vatican.

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Though the environment was one of tranquil academic scholarship, I lived charged with anticipated performance anxiety about the seminars on *the brain as a dynamical system* I was scheduled to present to these (I feared) ready-to-be-disdainful, prize-winning, pure mathematicians and theoretical physicists.

My dorm-style sleeping room at *IHES* was, in winter, painfully cold and drafty; the narrow iron bed's thin mattress contained lumps of persistently disturbing dreams, the small scratched table for work shim-irreparably wobbled. A faded poster of Van Gogh's garden was tacked crookedly on the door facing the toilet in the dank, dimly lit small bathroom. A dwelling for distracted young mathematicians. A retired but still famous Parisian chef cooked many course, elegant meals every afternoon. The food was accompanied by so many liters of unlabeled red wine and peer pressure to be French and socially drink it that it became a choice between dulled, blunted,. sleepy post-prandial afternoons or living on bread, many cheeses, apples and Perrier water, alone in my room. I chose the latter.

Thom's gifts to us theoretically oriented non-mathematicians were diagrammatic, easy-to-visualize pictures that allow the intuitive capture of counter-intuitive discontinuities in functions. How we might imagine that a smooth and continuous change in a cause of something can lead to a big, discontinuous change in the results. His system of topological (shape not size) diagrams was useful when considering up to four causal variables and one to two dependent variables that described how things behaved.

For an important real life example, in modern clinical pharmacology, the smooth *dose-response curve* consistent with the physician's intuition that if a little drug didn't work, a little more may do so, should become an up and down search for the dose-region for the desired effect which may involve a lower amount than a previously ineffective drug dose. The therapeutic effect may occur in the middle of a narrow dose range with too much or no effect occurring out of this span. In many physical systems, sudden and global transitions in state, from incoherent light rays to coherent lasing and from laminar flow of fluids to turbulence, emerge unexpectedly when causal parameter are moved into what some call the *critical region of the values of control parameters.* Outside this region, cause and result

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were behaving linearly and smoothly whereas within this region we observe global and dramatic changes via a forced discontinuity in what Thom called a *catastrophe* and others use related words such as *bifurcation* or *phase transition*. The transitions from painful fatigue to running rage and then to ecstatic transcendence feels like the gifts from two kinds of Gods, the first, bearing the righteous lawfulness of the Old Testament, the second bringing the empathic forgiveness of the New Testament Jesus. Catastrophe and bifurcation theories predict and keep track of these transitions using mathematically describable changes in global characteristics of the "motion" using technical descriptors such as *eigenvalues*, *germs and jets*.

Thom taught me my first catastrophe, called the *cusp,* in words during our late afternoon walks along a shadowed green wooded path on the grounds of the Institute des Hautes Etudes, outside of Paris. My homework consisted of trying to visualize his verbal descriptions. It was not until weeks later that he drew the geometric object being discussed on the blackboard. With eyes twinkling and in his provocatively playful style, he said,

"Imagine an empty rectangular box with the front edge of its roof buckled into an `S' and the back edge, an unfolded, left-to-right gradually rising simple smooth curve. If one moves the causal force from low to high, from left to right along the back of the box, the changing effect (represented by height) would be smooth; moving from left to right in the front encounters a sudden drop off at the S shaped buckling, a discontinuity in roof height indicating a discontinuity in effect. The energy equivalent height of the roof graphically indicates the amount of result. The roof is the *manifold* upon which the result of causal change is portrayed. The two dimensional floor of the box represents a graph of the two causal parameters, the increasing amount of *normal factor* going left to right along the `x' dimension, the increasing amount of *splitting factor* (taking one from the back to the front to the region of the buckling) going back to front along the `y' dimension."

He gave me some examples of systems that showed cataclysmic changes in effect from smooth changes of *normal* and *splitting factors.* About the onset of a war: "At the back of the top surface of the box, the manifold, the *normal factor* increasing from left to right is the amount of the perceived threat. The *splitting factor*

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decreasing from front to back is the cost (and ability to pay) for war. Without the financial capacity to make war, threat goes from left to right smoothly at the back of the box as tension gradually increases without the onset of armed conflict. When effective fighting capacity is cheap and/or already well funded, the country well armed, the increases in threat go from left to right at the front edge of the box and encounter the cliff of catastrophe and war is declared. Cost of, or ability to wage war varies from the front to back, and serves as the *splitting factor.* Considering prison riots, social tension is the *normal factor* and alienation (degree of identification with prison authority) is the *splitting factor.*" Using factial expressions of dogs sketched by the Konrad Lorenz, Christopher Zeeman then of Warwick Mathematics Institute in England, considered countenances reflecting increasing rage as the normal factor, the amount of fear was the splitting factor. Increasing rage at high fear increased smoothly at the back of the box; at low fear, increasing rage falls off the cliff to an animal attack at the front of the box." He paced as he talked, occasionally looking up to see if I was following him. He continued,

"A light above the box casts a shadow from the roof to the floor, outlining the gradually widening fold created by the transition from the smoothly rising back of the roof to its `S-shaped' front. This triangle on the x-y causal floor is the region in which the discontinuity in the result surface roof results and is called the *bifurcation set.* An increasing amount of the causal `normal factor' is represented from left to right along the `x' dimension, the results of which change smoothly at the back of the roof but encounter a discontinuous jump up or fall down crossing the inaccessible crevice in the `S' fold at the front of the roof. Again, the triangular shadow on the floor made by the fold indicates the parameter region in which discontinuous changes in the result surface occur. The reason the parameter that determines the front to back location of the left to right movement of the `normal factor' is called the `splitting factor' becomes obvious. Its value determines whether the results induced by increasing amounts of `normal factor' will be smoothly changing or generate a discontinuous jump. The entire visualizable object is called a *cusp catastrophe* and it along with higher dimensional parameter region-inspired shapes such as the

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swallowtail and *butterfly* buy back the smooth *DE* deterministic intuition lost with discontinuous changes in results."

He grinned mischievously as he asked, "Can you see it?"

Thom's catastrophes serve as accessible and powerful theoretical settings for the use of *energy as a generalizable, one dimensional, dependent, resulting effect*, influenced by one or several, sometimes conflicting, independent, causal, variables. For more examples: the weight of a ship (smaller to greater, left to right, along the x, *normal dimension*) and the position of center of gravity (smaller to greater, front to back, along the y *splitting dimension*) are causal with a jump in roof-height *energy* from stability to capsizing, a discontinuity emerging from initially smooth changes in stability. As above, gradually increasing tension (the left to right *normal factor*) and alienation (the back to front (*splitting factor*) in inmates generate a sudden increment in *energy*, from subtlety increasing tension in relative quiet to the sudden outbreak in a riot in the prison population. Embryological *notochord somitogenesis*, (that which become the vertebrate of the spinal column) has a smooth (left to right) causal influence that Chris Zeeman named a *normal factor*. It is the smooth growth of the material wave of mesodermal (to become muscle, connective tissue and bone) tissue. Zeeman called the front to back dimensional gradient of influence, the secondary wave of adhesiveness, the *splitting factor*. The value of this secondary wave co-determined a critical-valued interaction between these causal parameters leading to a discontinuous change in the "energy" equivalent continuity of developmental growth and vertebral column segmentation.

A little more technically: Thom's basic mathematical contributions were in *differential topology* and *analysis* with particular emphasis on what is called *structural stability* of surfaces representing and supporting actions called *manifolds*. For example, in a graph of a function, say $F(x)$, such that a change in cause x determines what happens to the result $y = F(x)$, the stability question involves what happens when one perturbs $F(x)$ with a littleδ, i.e. $\delta + F(x)$. Do the *topological properties of the surface representing the potential range of actions of the system* (such as nearness of an originally close point set, continuity and connectedness of the surface, its dimensionality, its compactness as a generalization of finiteness)

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remain the same after perturbation? Note that the inter-data point metric distances are not considered. If they do, the two dynamical objects being compared are *topologically equivalent.* The test of this equivalence requires the mapping one set onto the other with, at most, smooth distortions of either or both surfaces.

In the context of catastrophe-related *bifurcation theory*, if a δ converts a steady valued *fixed point* to an oscillating *cycle* on a manifold of potential actions, also called a *state space*, then the fixed point system was *not structurally stable*. In phase space, this is seen as a change-in-causal-parameter induced transformation of a dot to a circle. If the one frequency circle is perturbed to a manifold of the system's actions consisting of two independent frequencies, the circle takes the topological form of the crust of a doughnut, one frequency graphed spiral winding around the doughnut, the other winding along the doughnut around its orifice, the circle is not structurally stable. If δ distorts the frequency-amplitude relations on a surface such that the manifold of possible actions is distorted from a doughnut to a tea cup, both topological manifolds being one holed surfaces and therefore *topologically equivalent*, the system is *structurally stable*. Perturbed systems that maintain the sequence of points in time in sequential order (though the distances between the points may be different), are generally structurally stable.

The seductive possibility, one which Thom realized so successfully, was that in the language of distance-independent differential topological forms, there would exist a small, finite set of shapes categorically describing the causes and result parameter spaces from which, even without specific quantities, universal qualitative (including discontinuous) behavior could be described and sometimes predicted. A formal yet general categorical system within which a small set of universal *discontinuous changes in global qualities* could be rationalized seemed seductively applicable to the enlightenment transitions, *spiritual transformations*, appearing suddenly after months and years of disciplined spiritual practice. The Platonic view is that the universal forms of discontinuous change existed before they could be about anything specific, before the universe was born.

In this era of nonlinear dynamics and dynamical system, common dynamical scenarios give accounts of smooth changes in causes leading to discontinuous

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changes in results. The Nobel Prize winning solid-state physicist, Phillip Anderson, in a short but memorable piece in *Science* in the 1970's said it tersely, "More is different." This general, qualitative mathematical theory of discontinuous change models nicely the sudden delivery of the *first* and *second second winds* from gradually and continuously increasing running distances as well as the abrupt transmission of the guru's "energy", *shaktipat*, from smoothly increasing amounts of chanting, meditation, guru service and Baba love. Gradually changing forces leading to sudden changes in an energy-equivalent result are found in most rigorous form in Rene′ Thom's *singularity-bifurcation-catastrophe theory* applied to *rational mechanics* and *geometric optics*. Here the existence of already solvable computational formalisms makes this more qualitative approach superfluous. On the other hand, the power of this both basic and applied mathematical orientation and method lies in its approach to the qualitative understanding of variously induced global and sudden changes in an energy-equivalent observable in biological, psychological, spiritual and social systems, fields of study in which little abstract and formal lawfulness presently exists. Oxford's Chris Zeeman's more accessible applications of Thom's deeper, more generally ramifying, almost mystical (due to their apparent wide generality) results, include approaches to real world problems such those above as well as the sudden change in excitable membrane potential accompanying the generation of the heart beat and neuronal discharge; mechanisms of opinion change, stock market crashes and, as noted above, the social science of riots. Whereas Thom's *On Structural Stability and Morphogenesis* can be said to be scriptural, Zeeman's Selected *Papers, 1972-1977* constitute the Book of Common Prayer of this church.

To review and place *catastrophe* and *bifurcation theories* in the context of the differential equations of mathematical physics and biology, causal determinism implied by differential equations conventionally requires continuity and smoothness in behavior to be credible. Our intuitions as well as the formal conditions for the generic differential equations of mathematics and physics imply that smoothly increasing amounts of cause lead to smoothly increasing results and yield at least local predictability: a little more leads to a little more, a little less leads to a little less.

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This smoothness-dependent intuition of determinism breaks down in nonlinear equations as well as in a wide variety of the machines of experimental physics, from the sudden coherent lasing of previously incoherent light to the vortices and turbulence in suitably bounded rotating or flowing fluid. It took me a while for these topological still shots and movies of the head to become real. Nevertheless, the enrichment of intuition was well worth it. Of course one could smoothly increase the *normal factor* weight of a ship until it gradually sank, but if one moved the center of gravity *splitting factor* to an eccentric position in the ship in the *parameter region of the bifurcation set*, a sudden global capsize before weight-induced gradual sinking made sense. I could see it. Indeed, increasing *normal factor* tension in a prison population that was identified, not alienated, from the officials and mores of the penal institution, would increase social symptomotology gradually. However, increasing the *splitting factor* of social and institutional alienation results in the cataclysmic change of a riot with increasing tension. I could see it.

Do we need to know the causal equations to anticipate instability and discontinuity in our lives? Zeeman making Thom's thoughts accessible to us plain mortals said no. He suggested that we could use *several diagnostic phenomenological signs* to make a good guess about whether we are *near or within the bifurcation set.* Depending upon the route that the causal variables take through the shadow of the bifurcation set, we may see *very large fluctuations* in our observable. The Dow or S&P stock indices in the neighborhood of a sudden large change is often presaged, sometimes for weeks, by a marked increase in volatility, fluctuations between extreme values. Theorists call the statistical properties of a time series of values behaving this way *anomalous variance*. For several months, I did psychotherapy with a genuinely spiritual Catholic priest who only some Sundays served the Eucharist, the corporal presence of our Lord at Communion, wearing no trousers or underpants beneath his robes. A sudden change in a stock index in response to the "shock" of a terrorist attack takes much *longer to settle down* if a cataclysmically bigger change is in the neighborhood. This extension of the system's usual *relaxation time* is sometimes called *critical slowing*. In the bifurcation

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regime of a schizophrenic break down, *critical slowing* can be both global and literal as the patient freezes in catatonic postures.

In the neighborhood of the *bifurcation set*, big jumps in the stock index, up or down, are possible under almost the same surrounding conditions. This stock analyst-humbling phenomenon is called *bimodality.* Jimmy Swaggert's Saturdays were often spent watching the show at naked dance parlors and buying videos at the pornography shops of Metairie Highway near Schwegmann's Grocery outside New Orleans. Sundays found him on national television engaged with infectiously real, transcendent experiences in the public arena of the pulpit. The ecstatic congregation was deeply moved by his eloquent and tearful sermons about sin and salvation. Counter to most suspicions, this is less conscious fakery than the genuinely felt alternating states intrinsic to the *bimodality* in neighborhoods of *spiritually unstable, born again transitions*.

Similarly, beginning with nearly the same initial values near the boundary of the *bifurcation set*, very similar motions lead to dramatically different results. This counter-intuitive behavior has been called *divergence.* At UCLA's Neuropsychiatric Institute, I interviewed a pair of lively teenage, genetically identical male twins raised by a loving family in Los Angeles's Valley. One was president of his high school class, a Sunday school nursery school volunteer and a Saturday soup server to the poor. The other twin sold pot and cocaine to support his habit. Deep and potentially dark mysteries live in these spiritual bifurcation sets. They leave us pondering child sexual abuse by deeply religious clergy and the massacre by mass suicide of a New Christian congregation by James Jones. We wonder why it is that fundamentalists (Jewish, Christian and Muslim) have the most ecstatic and direct validating experiences of God and do the most shooting and bombing of other people. In Burt Lancaster's portrayal of bifurcation set dweller, Elmer Gantry, charismatic believer and exploitative psychopath, were simultaneous and both credibly real.

Another feature of the occupancy of this bifurcation region in control space is that the values producing a sudden jump that occur passing through going one way along the "normal" dimension usually jump back much further along when moving

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the other way. Theorists call this characteristic sign of bifurcation land, *hysteresis.* It is generally known that sudden healing changes of the first born again experience can arrive magically fast whereas a run at it a second time, another born again state after the loss of the first one, comes, if at all, with much more effort and difficulty. Members of Alcoholic's Anonymous know that getting on the AA wagon the first time may be quick, joyful and easy. Getting back on this wagon after a fall is much more painfully slow and demanding, analogous to the Carmalite monk; St. John's lost faith engendered suffering of the *Dark Night of the Soul.*

Viewing the instabilities and extremes near the boundary of a bifurcation brings inquiries and advice about why a rational compromise, some form of disciplined moderation, would not be more desirable. It turns out that in this parameter regime, the in-between state is intrinsically *inaccessible.* The pocket in the *S shaped fold* of the upper manifold cannot be attained, at least for very long, by varying the values of the two parameters. However, if one increases the number of controls, it might be possible to stabilize a small island in a parametric sea of instabilities. In an application of this strategy, Smith College and Harvard Professors James Callahan and Jerome Sashin used a geometric representation of the difficult to stabilize region of normal weight on a *double cusp* manifold representing the behaviors of patients with eating disorders with both anorexia nervosa and bulimia. They varied *five controls* to stabilize a very small result area representing normal eating by varying the control values for ability to *verbalize feelings*, to *imagine solutions*, to defend against anxiety with unconscious forgetting called *repression*, to make contact with *realistic rationality* and to *modulate feelings* with say exercise, meditative practice or psychopharmaceuticals.

My experiences with the so-called *borderline personality*, with the tendency toward sudden and global personality change, from Sunday school teacher to Harlot in the space of a breath, has been both sexually exciting and personally ruinous for me in my life. I could feel the instabilities in these dwellers of the bifurcation pockets and my heart raced at the promise of mutually unconsidered impulses, the blurring of orificial identities, the experiments with sexual roles and modes and the incipiency of collapse into regressive mud play. Most of all, I anticipated that their

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screaming orgasms, potentiated by a natural inclination to bifurcate, would be so messianic as to carry me along to a transcendentally erotic new place. Unfortunately, paranoid rages, bursts of promiscuity and hopeless inconsistency of goals and efforts dominated the remainder of our living days.

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CHAPTER 4:

SENSUAL IN-BETWEEN ENTROPIES

Since the early teens, I've been beguiled by girls and women that have what might be regarded as *exquisite sensibility,* perhaps more precisely, *exquisite self sensibility.* These inhabitants of the near transformational neighborhoods of *bifurcation sets*, are grandly responsive receivers of emotionally significant information arising from their insides and the world. They are the canaries in the deep mines of human experience. Not the usual one lively-eye, one sober-eye, binocular difference of most of us, both their eyes sparkle, their feeling antennae await a happening and each is regarded as new. I spot these brains in a crowd within minutes and am compulsively drawn to know them better, to become part of them, to vicariously experience and serve them. They seem to have little inhibitory control of even weak sensory information on its way to their strong, global feelings. Near ecstasy and excruciating pain await. They feel their anticipations with their body, down to their painted toes. Their receptivity brings me lower abdominal warmth in remembrance.

At sixteen in my Dad-purchased second hand Ford convertible, I was parked with my new girl friend on Sarasota's Lido Beach, hearing and seeing dark shadows of the Gulf of Mexico's waves hit white sand against the night sky. I took her flat party shoes off to message her feet. When I kissed her left foot and sucked gently on her toes, she gasped and became faint. She told me that a strong electric shock

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had run up her back. The passionate licking and sucking of her musky, moist, pink labial lips brought what she said were explosions of pink and blue lights. She had several ecstatic multicolored crises in a row, sometimes without pause. She begged me to stop. I was as pleased as a sexually inexperienced young man in love could have possibly been.

Bowled over by what seemed to be the uniquely sensual properties of her brain, I began to wonder if her sensitivity was more general when she asked me to keep the windows open or top down, even in the cool of a Florida January, because the exhaust smell in my car was suffocating, though I couldn't smell it. The car had been checked and registered negative for abnormal fumes and leaks by Anderson Ford. She asked me never to wear any kind of after-shave lotion because it choked her. Jazz music on the car radio had to be played quietly. On-coming headlights gave her headaches. Her mother, sometimes desperate, called me for help during her daughter's episodes of premenstrual emotionality and early menstrual discomfort. During these times, we would drive together for hours as she explained the many different colors of lower abdominal pain and how this particular kind yawned darkly before it cramped. It was more purple then any of the others. I tried to explain what I intuited but didn't understand to her mother about the her gift of unfiltered information coming through her nerve endings, her ever readiness for surprise and her brain's unwillingness or inability dampen or ignore what it didn't like. She saw things in art, heard things in music that I only saw, and heard after her telling. She had tearful smiles listening to Debussy's Afternoon of a Fawn. The flatted fifths of Charley Parker and the laconic riffs of Miles Davis made her anxious.

Since then and for all these many years, the same sensually susceptible brains showed up in my life carrying a variety of woman's names and I never lost my fascination for them. I learned that their heightened awareness extended to the spiritual realm with unusually strong metaphysical inclinations and readiness for transcendent experience. They seemed to live closer to the direct experience of God. Attending Assembly of God and other Pentecostal midweek service, I found that praying in tongues and dying in the Lord came as easily and dramatically to them as their orgasmic experiences. At the same time, distant bad news could

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suddenly become immediate and loud in a litany of threatening thoughts that hooked and persisted through sleepless nights. They taught me to see genuinely the delicate beauty of flowers and to know in my stomach that some forms of sadness felt hollow like homesickness. In medical school I found that that many of them were the clinic patients, women and men, with unusual sensitivity to chemical odors, think Gulf War Syndrome, and fibromyalgia, which I heard as unusually sensitive awareness of normal sensory information about posture and position coming in from the bones and muscles of the body but experienced as pain. This background of odorific and somatic information is usually repressed from consciousness by the rest of us. Their medical histories contained detailed accounts about how each of their organs was feeling at the time, sensations that the textbooks say we are incapable of consciously knowing. Internists and psychiatrists often dismissed their accounts as signs of *somatoform disorder*, psychological conflicts expressed in the language of body feelings.

In the psychophysiological laboratory, I learned these brains tended not to *habituate*. Each of a series of noises continued to elicit *startle responses* that could be picked up in brain wave recordings or in the running record of a psychophysiological, lie detector, machine. In psychoanalytic training, I learned that these brains remembered their dreams more richly than the rest of us and that treatment with over twice a week analytic sessions was potentially dangerous. The psychoanalytical situation-engendered fantasies and feelings could get too strong and exaggerated, too real.

Professor Iris Bell of University of Arizona's Alternative Medicine Research Program has, studying these brains, found slower reaction times, defects in divided attention psychological tasks, longer latencies to the first dream, and unusual patterns of odor reception called *cacosmia* or *dysosmia*. Using brain wave and cardiac interbeat interval data as markers, Bell reports the increase in the amount of *alpha awake brain waves* and decreases in *cardiac interbeat interval variation* associated with increasing sensitivity, rather than habituation, with repeated exposure to a variety of smells over time.

In spite of these brains usually requiring what is known as high maintenance

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in relationships, I continue to be erotically spellbound, in love with them in all their forms. Questions about how to think about these exquisitely sensitive women, *Bell's Syndrome* exists but is rarer in men, continue to drive aspects of my scientific research. It has been variegated quest, which began with trying to find a general conceptual framework that would help my understanding of this unique capacity to be aware and process large amounts of internal and external information that escape the awareness of most of us. As one might guess, this search led to fundamental ideas about *information* and its inverse, the *entropy* indicating the amount of *information transport capacity*, with respect to their characterization, quantification and measurement.

To get to the end from close to the beginning, we recall that it was Claude Shannon and his followers who both mathematically proved and experimentally verified that a receiver must have more *entropy*, less already fixed knowledge and more wondering, than the sending source, in order for the message to be sensitively and reliably received and encoded. Sensibility seems to have something to do with the readiness for information transmission afforded by the brain's high entropy, minimal fixed information states, in its resting dynamics. Their remarkable receptivity derives from a baseline brain state like the formless emptiness of the *bodhisattva's* "...no form, no sound, no feelings, no perceptions, no consciousness..." of transcendent Tibetan Buddhism as described in the *Heart Sutra of The Dalai Lama.*

In Chinese Medicine, *xu*, meaning *emptiness*, contrasts with *shi*, the word for *fullness*, both of these complementary opposites having multiple specific meanings. Most metaphysically relevant is the characterization of *xu* as the emptiness of the deepest reality of being and the highest state of human spirituality. Like that aspect of Lao-Tsu's ineffable *Dao*, *The Way* that is empty, *xu* indicates a mind devoid of desire, being lucid and serene. In the context of dynamical form, *xu* shares the structureless, non-imagery of maximal entropy systems and *shi* the lower dynamical entropy of fixations on form, desires and beliefs. Shigehisa Kuriyama's *The Expressiveness of the Body*, elucidating historical and conceptual divergences of Greek and Chinese Medicine, notes that *xu* was the supreme end of self-cultivation

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and the secret to vigor and longevity. "...to achieve fullness of life one had to abide in empty nothingness, *xuwu*." In Lao-Tsu's *Tao-Te-Ching,* "...the Way is gained by daily loss, loss upon loss until...by letting go, it all gets done..."

William James, in *The Principles of Psychology*, tried to capture the subjective dynamics of the brain as an on-going preconscious stream of statistical wave processes. He envisioned autonomously increasing and decreasing coherence emerging spontaneously and from sensorial evoked thoughts via the confluence and disaggregation of statistical wave processes, "...wave crests and hollows..." that achieved temporary statistical stability by "...feelings of relation, consubstantial with our feelings or thoughts of the terms between which they (only temporarily) obtain." In the more receptive, higher entropy brain systems, fleeting forms change without continuity, jumping from one to another with "magical rapidity," *but being not already engaged, are available for use for self-organized structure evoked by new information*. Without ordered, low entropy, preconceived ideational defects in the resting random brain field, the full attentional statistical machine is available to sensitively respond in self-organized, quasi-stable states of *cognitive, conative and affective integration*. They then disappear; this brain relaxes quickly, ready for new experience. This contrasts with those brains that are dominated by islands of order composed of personality fixations and rigid belief systems, *low entropy defects*, which interfere with sensorially responsive *self-organization*.

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As in most systems of authoritarian premises, precise definitions and what appears to be strict logical continuity, as in discussions of Torah among Orthodox Jews and Canon Law by Catholic bishops, *classical equilibrium thermodynamic ideas* that are borrowed for use out of the context of their origins, risk the calumny of their physicist practitioners. We have probably already earned more than a little distain from those quarters with our use of none-minimal or none-maximal but *in-between entropies.* This phrase cannot be found in the literature of physics or, as such, in the writings of *communication and information theory*. In the modern theory of nonlinear motion called *dynamical systems*, in-between entropies can be generated by *chaotic systems* that are non-uniform in their *rates of separation of near by points* and *convergence of far-away points* in dynamics that have been previously described as *nonuniformly hyperbolic.*

The energies and their transformations that fuel and support *karmic escape* from the personality fixations of *samsara* and accession to *unmanifest Divine Life* can occur without the loss of the richness and multiplicity of apparent reality. Big internal changes without external sign can occur in the arrangements of the ineffable and mysterious formless silence within which we have associated with states of *high, but not maximal, in-between entropy*. For examples, the Indian Saint, Sri Aurobindo, in the early 20th Century, the Catholic metaphysical anthropologist, Teilhard de Chardin and currently American pandits (spiritual seekers with intellectual and academic inclinations) such as Ken Wilber, among many others over the millennia, direct us toward the goal of Nirvanically changeless emptiness without the properties of space or time. At the same time, we maintain an astute and effective yet distantiated appreciation for existential realities. The *non-dual enlightenment of Integral Being* or *Yoga* involves realizing emptiness through the world of form. There is a way of thinking about and even computing that "nothing within" and its changes.

As John R. Pierce suggested in the 1981 revision of his book that made the theorems of the father of *communication theory*, Claude Shannon, so accessible, "…if we want to understand information-related entropies, it is perhaps best to clear our minds of any (physical) ideas associated with the entropy of physics."

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Nonetheless, historical comments about what the *classical thermodynamic term, entropy*, is and is not about are in order.

We recall that Richard Feynmann, in his well-known 1962 class notes, *Lectures on Physics*, said that the subject of thermodynamics is the study of relationships among the heat, energetic and organizational properties of materials, *without knowing their internal structure*. Historically, the relational formalisms of *equilibrium thermodynamics* emerged before our knowledge of the internal structure of matter. For examples, the pressure in an insulated container of gas is due to molecular bombardment of the container walls, which increases with heat or compression of its volume. Compression of its volume increases its temperature and expansion of its volume leads to cooling. Note that these relationships hold without specifying the constituents and the specifics of a particular gas or solid.

In his lectures, Feynman's intuitively accessible examples of reversible thermodynamic properties are reminiscent of his on camera performance at the Senatorial hearings about the Challenger disaster. Recall that he dropped an O-ring in a glass of iced water demonstrating cold-induced rigidification of the rubber ring, which he postulated to be the cause of the fuel leak and resulting explosion. In his *Lectures,* he said that if one holds a rubber band between ones lips as a crude thermometer, stretching a rubber band heats up the lips and relaxing it cools them. Working the same system in reverse, and *equilibrium thermodynamic systems are classically reversible*, we find that heating a rubber band makes it contract. These changes involve complicated alterations in the internal arrangements of the polymeric strands of rubber, their structural properties, the details of which, for the purpose of global thermodynamic characterization, need not be known. The *relationships between physical state, energy and temperature* in this material were predictable from *thermodynamic laws* even without specific knowledge of the complex internal structure and physical dynamics of rubber.

Thermodynamic theory, which makes deep conceptual connections between *quantitatively measurable primitives* such as *heat, hotness and work* and *the invisible* in the form of derived ideas such as *energy and entropy*, yielded an

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enormously rich and logically consistent intellectual framework from within which to characterize macroscopic behavior composed of unknown molecular mechanisms. Ideas about entropy grew out of William Thomson's (a.k.a Lord Kelvin) thermodynamic laws about *energy conservation* and its allowable transformations. Later Clausius decomposed the *energy* into that which was available for mechanical work, called *work-content*, and that which was not, called *transformation content*. He referred to the *transformation content*, a reflection of what changes in the internal order properties of the system that occurred as a concomitant of changes in energy and heat, as the *entropy.*

Rudolph Clausius added the word entropy as a thermodynamic property to the conceptual armamentarium of theoretical physics in about 1865. This followed the earlier work of the French engineer, Nicolas Leonard Sadi Carnot, who was trying to develop a theoretical framework within which efficiencies in heat-generating engines might be understood. It implicated positive, > 0, changes, *d*, in *entropy*, *S,* with changes in time, *t*, *i.e.* $\frac{dS}{dt} > 0$, entropy is increasing in time, as a concomitant of the inevitable mechanical inefficiencies in an energy driven system. The resulting losses in the form of *wasted energy* show up as increases in *molecular motion*, which could be *estimated from the increases in heat*. Wasted energy dissipated as heat increases the amount of random motion and volume occupied by the surrounding molecules in physical processes involving *heat, pressure, vaporization, condensation* and *work*; all elements of that era's dominant physical metaphor, the *steam engine*.

The highly developed, multifaceted, often quite abstract formal characteristics of the inferred property, entropy, prevent glib definitions and generalizations. In the context of Kelvin-Clausius theory, the entropy of a closed system will remain the same if it is isolated from any matter or energy exchanges with the environment. If heating a system such that the change, *d*, in heat, *Q*, is positive, *i.e.* $dQ > 0$, it experiences a rearrangement in its microstructural motions, but the temperature is left unchanged. The (inferred) entropy, *S*, increases (i.e., $dS > 0$) as the ratio of change in added heat, dQ, over the unchanging, absolute

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temperature, *T*. Thus, one definition of entropy change is $dS = dQ/T$. In classical contexts, dS is expressed in *units of heat* called *Joules per degree of absolute temperature* in units Kelvin, the temperature in Centigrade plus 273.16°. The best-known physical image involves the heat-energy transfer to and from heat baths called *reservoirs* as intermediate actions of the work of the heat driven engine executing what has come to be known as the *Carnot Cycle*. The same formulation emerges in this more concrete context: the heat, *Q*, transfer, *dQ*, at a particular absolute temperature, *T*, *dQ/T*, has been used to define an entropy change, $dS = dQ/T$ related to some not-need-to-know-about specific alteration(s) in a system's internal physical properties.

If one allows some loose thinking about *heat-induced increases in the statistical randomness of molecular motion* in the above reservoir that is associated with the loss of *useable* energy, the positive entropy change, $dS > 0$, is vaguely relatable to the kinds of *information entropies* to be discussed below. If a gas trapped in an insulated, physically *isolated*, closed cylinder is allowed to expand *infinitely slowly*, *reversibly, called adiabatically*, pushing up the piston that closed off its end, the gas will become cooler, energy having been expended doing the work of lifting the piston. Defined as an isolated system (of course no where in the real, non-laboratory, world can this condition of absent exchanges of energy or matter with the environment be found), it is a *reversible* process, because returning the energy of the work by, again, *infinitely slowly* pushing down on the piston and compressing the gas to its original volume, returns it to its former temperature-defined energy state. In this historically prominent thought-toy of physics, there has been a *reversible* change in energy but no changes in the entropy, $dS = 0$. The gas's *heat, temperature* (and *energy* and *volume*) can be completely restored in this metaphysically mythic classical thermodynmical tale of an entropy-conserving, reversible process.

While fixed entropy and independence of the specific path is the case for the above noted abstract reversible cycle, in the real, irreversible orbits of most physical and all biological systems, entropy increases, $dS > 0$. Walter Nernst's 1907 *heat theorem* yields a zero point from which to determine a difference measure in the

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postulated, real physical world of ever-increasing entropy. He showed that at an absolute temperature of zero, entropy is zero. We can illustrate an approach to this singular state by placing a heated metal rod in ice water which would result in a decrease in the entropy of the rod's molecular motions by $dQ/ T_1 < 0$, the cooling reducing the complexity of molecular motion in the metal bar and an increase in the entropy of the water by $dQ/T_2 > 0$ indicating an increase in the amount and complexity of the surrounding water's molecular motions. Of course the heat moves from metal rod to the water as $T_1 \rightarrow T_2$ making $dQ > 0$ positive and the entropy change, $dS = dQ/ T_2 - dQ/ T_1$, also positive. In another simple example, producing friction by rubbing a surface generates heat, $dQ > 0$, at a temperature T. This induces a positive change in entropy, $dQ/ T > 0$, in the form of increasing amount and complexity of the patterns of molecular motion in the air surrounding the rubbed surface.

Using another related and well-known thermodynamic thought toy, the original isolated, insulated body of gas in the cylinder is partitioned by a membrane into two chambers, one containing all the gas with its temperature, pressure and ability to do mechanical work and the other a vacuum without these properties. This equilibrium state is changed into another equilibrium state by suddenly removing the membrane, filling both chambers with gas and, while increasing its entropy *irreversibly*, $dS > 0$, *removes* at least some of the gas's ability to do piston raising work. In the context of classical thermodynamics, it is in this way that *irreversibility can be defined by its associated increase in entropy.* Though there has been no change in total energy in this insulated closed system, an increase in entropy means a decrease of the energy available for work. The *increased disorder* in the gas is associated with the loss of ability to convert heat, thermal energy, into mechanical energy. Historically important and still available elementary texts by Enrico Fermi (1936), Mark Zemansky (1957) and Herbert Callen (1985), among many others, explicate clearly the formal, but far from biologically relevant, classical theory of the *physical entropy of closed equilibrium thermodynamic systems.*

Growing in part out of the formal thermodynamics of physics, *statistical mechanics* offers yet another set of intuitions about the not-necessarily-known

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molecular details associated with changes in entropy. These ideas are closer to applicability in problems of making measures on the behavior of biological systems. Very generally, in the statistical mechanical context, an increase in entropy means a decrease in the order, which can be a quantitative observable reflecting a decrease in predictability and/or knowledge about the system. For example, we can locate the molecules of the gas more accurately when they are all on one side of the membrane-partitioned cylinder compared with the situation when the membrane is suddenly removed. This accompanying *increase in ambiguity and decrease in knowledge in locating a set of gas particles reflects a statistical mechanical view of increases in entropy.* Can anything general be said about the bounds on an increase in entropy? The statistical developments of the Yale mathematical physicist, Josiah Willard Gibbs (about 1875), consonant with the logical arguments of the Greek mathematician, Constantin Caratheodory (about 1910), conclude that the *entropy increase goes to the maximum allowed by the constraints imposed by or upon the system.* A change in likelihood as a *probability* is a characteristic way to quantify the *entropy change*, reflecting an alteration in knowledge or its reciprocal complement, *uncertainty*. The system's entropic uncertainty said more colloquially, and relevant to the *Bell Syndrome's* women of my life, is its *capacity for surprise.*

A statistical mechanical approach to the total entropy of a bounded set of molecules in motion involves summing this property across all the participating molecules. We let N be the number of particles involved. As a problem in Newtonian mechanics, each of the N particles is represented in 6N dimensional phase space. That means that each point represents one of the N molecules in the *three dimensions of location space* plus *three dimensions of motion space as its velocity*, more specifically, the product of *mass times velocity called momentum*. This adds up to 6 dimensions of measurement. This so called *phase space reconstruction* of the molecules of a gas as individual particles are a daunting task, though fast computers and new algorithms are making computations from first principles more generally attainable. Those based on the *first principles of short-range repulsion and long-range weak attraction among particles* and the bumper-car *collision*

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dynamics between them can now be implemented if the system of particles being simulated is sufficiently small and the computer simulation is for very short times.

To transform the entropy into something more statistical and global, we return to the theoretical work of Ludwig Boltzmann whose formalism was used previously to quantitate pathological developmental simplification. He assumed that given a set of constraints, say the closed volume, V, of a box, B, of a fixed size, $V(B)$, the orbit of each particle would eventually explore all the space in the box that was available to it. Boltzmann's entropy became a constraint dependent, n-dimensional volume measure, with the assumption that the entropy, S, equals the logarithm of this volume measure, $S = \ln V(B)$. To calculate a value for the entropy, compute the volume of the molecular motion as determined by the invariant constraints of the system, such as the volume, temperature, pressure and/or its total number of molecules. We may *partition*, discretize, the volume up to some limit of resolution such that it is divided into Ω small boxes, each containing the representation of a particular state.

Making the same assumptions of closed system, equilibrium thermodynamics, such a system is completely isolated from outside sources of matter and energy, it spends equal time in each of its Ω available states. In such a case, the *characteristic occupancy time of any state is inverse to the number of states available*, e.g. $1/\Omega$, and the system's *entropy is maximal* for that set of states. Under these conditions, $S = k \ln(\Omega)$, where the k term is the Boltzmann constant that contributes to the numeric units of entropy, as above, in Joules of heat /degrees Kelvin of the temperature. If the system is in *contact with a heat bath*, but cannot exchange matter with its environment, it is called *diathermally isolated*. The distribution of times spent in the available states of a classical diathermally isolated system of gas molecules can be represented by what is called a *Boltzmann distribution of probabilities of state occupancies*, ρ (as a function of their energy level, more measurably, their responsiveness, *susceptibility*, to heat). Here the *characteristic time* of the system spent in each state varies as the particular state's *probability*.

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Leaving the framework of physical thermodynamic entropies entirely, the *entropy of information* was introduced in the context of *communication engineering* in electrical and electronic devices. The metaphorical machine for the current age of entropy, analogous to the role of heat and steam engines in classical thermodynamics, is the *computer.* Energy in this context is a relatively trivial property. Ammeters and other monitors of load are unable to discriminate between a computer actively engaged in encoding and computation or one simply maintaining its dynamic memory while resting in computational readiness. This situation is very analogous to the results of early work discussed previously on the metabolic rates and sources of the *whole* brain's energy, oxygen and glucose metabolism, by National Institutes of Mental Heath's Seymore Kety and Louis Sokoloff and the State of Illinois Thudicum Laboratory's Harold Himwich. Using whole head arterial-venous, energy-in, energy-out, differences, they could not demonstrate differences in rates of whole brain metabolism between states in which the human subjects were engaged in solving mathematical problems or deeply sleep. In today's brain imaging research, using a variety of physical reflections of the brain's metabolic activity, it is the *differences in regional distributions of metabolic activity* that are relatable to subjective and behavioral states, not differences in total amount of energy expended. In graphically coded representations of the regional metabolism of the brain in action, one or another or many areas "light up" and others "grow dark" in correlation with changes in thinking, feeling and action.

The *entropy* first developed by Claude Shannon was formalized for use in 1948 in what was then called *communication theory* and now *information theory*. It represented a measure of the *ambiguity* and *uncertainty* that had the potential for being resolved by new knowledge. In this context, *entropy and information were obviously complementary descriptors*. A message that informs us about which of ten possibilities should be chosen contains less information than one that informs us about the proper choice to be made from among a thousand possibilities. The entropy of communication theory is a measure that is computed on uncertainty. The *information reception capacity* of a system is dependent upon the *amount of*

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uncertainty in the receiver that pre-existed the receipt of the message. In the binary coding scheme of digital electronic operations, the unit of information is the *bit*, a choice made between 0 or 1 in the resolution of a two state ambiguity at each place of some power of two number of places. Our relatively common computers these days have 32 or 64 bit processors. If these 0,1 choices are made in a random sequence in which each step is independent of the previous one, the sequential probabilities, are multiplicative: e.g. the probability of getting two 1's (heads in a fair coin) in a row are the product of each 0.5 probability: $\rho_1 = 0.5 \times \rho_2 = 0.5 = \rho_1 \rho_2 = 0.25$. Using the common base ten system of logarithms to demonstrate the algebraic fact that *multiplicative probabilities are logarithmically additive* (and ignoring the minus sign that comes with making logarithms of the decimal fractions of probability), we notice that $log_{10}(0.5) = 0.693147$ and $log_{10}(0.25) = 1.386294$ and that 0.693147 + 0.693147 = 1.386294.

The dot-dash choices of Morse code machines, the go, no-go gates of transistors, the open versus closed ion channel-mediated neuronal membrane discharge and the left, right spins of the single electrons of today's quantum computers lead naturally to an information encoding of multiplicative sequences as the sum of logarithms in base (equal to the number of available states) two, each $\rho = 0.5$ choice called, $log_2(0.5) = 1$, a *bit.* Shannon's 1938 master's thesis mapped George Boole's algebraic scheme for doing yes-no, either-or computation onto current switching devices such that circuit closed was "true" and circuit open was "false." Using Boole's laws such as "Not(A and B)" always equals "(Not A) *or* (Not B)" led to schemes for circuit routing through electronic gates which also serve for information storage in gadgets ranging from cell phone directories to computer hard disks.

Following Claude Shannon, each logarithmically additive entropy term is expressed as the sums, Σ_ι of its probability, ρ_ι, times the probability's logarithm, $\Sigma_\iota(\rho_\iota \times log_2)$ (ρ_ι in base two. A *logarithm is an exponent of its relevant base* such that, for example, the logarithm, base two, of $2 \times 2 \times 2$, 2^3, = 3 and 3 bits can encode eight binary (0,1) numbers: (000, 001, 010,011,100,101,110, and 111). Shannon used a hill-like, called *convex, entropy function* $S(\rho) = -\Sigma(\rho \ln(\rho))$. *The amount of*

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information required to gain knowledge of an event is dependent upon the probability of its occurrence. $log_2(0.5) = 1$ is the maximal entropy when modeling the equilibrium entropy of an independent random 0,1, (heads or tails) series of informational states as might result from flipping a fair coin a large number of times. This value would be maximal when the coin was fair, ρ(heads, tails) = 0.5, and the entropy would be 2(number of allowed states)$\times$0.5(probability of occupying each state)$\times log_{10}$ (0.5) = 0.693147...or in *bits*, $log_2(0.5) = 1$.

More generally, if system's behavior is *distributed equally among its possible states, the Shannon entropy is maximal and equal to the logarithm of the number of defined states*, for example, log_2 (2) = 1. Shannon's classical equation about information content says the amount of information, $I = -\rho\ log_2\ \rho$, measured in bits. The minus sign in this reciprocal relation indicates that the information content of data, I, goes up as the probability of occurrence of the observed data, ρ, goes down. Since soon we will be talking about brains and their various styles of information encoded content as well as its transmission, we note the other famous Shannon theorem dealing with limits on the channel capacity, C, for information transport is $C = W log_2(1+S/N)$ where W is bandwidth, the range of frequencies available for information transport, S is the strength of the signal and N is the strength of the noise. Recall that the $log_2(1) = 0$ so only the signal-to-noise ratio, S/N contributes to the value of the product of the multiplication by bandwidth, W. Transparent clinical examples come from studies of the perceptual and cognitive decline in normal geriatric patients in which the range of aural frequencies (W) heard without augmentation decreases with age as does the frequency range (W) observed in their resting brain waves. The inattentiveness of the obsessively worried ruminator can be used as an example of brain channel capacity being reduced by the amount of on going head noise, an increase N, which, of course, reduces the value of S/N and therefore C.

Measures of the *informational complexity of systems in motion*, in contrast with the *information content of a static equilibrium state*, are of *dynamical entropy*. Dynamical entropy is often called H, in contrast with thermodynamic and/or informational entropy, S. One can begin with a representational image of the

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location, velocity and directional tendency of every point generated by a dynamical system by an arrow on the surface of action, the *manifold*, of a dynamical system. This field of arrows indicating directional and strength of motional tendencies is called a *vector field*. A vector represents its location at the base of the arrow, its velocity by the length of the arrow (called the *modulus*) and the direction of the motion by the direction of the arrow. If we regard all moduli as equal to one, every vector on the surface has the same length. The resulting graphs are called *direction fields.* Looking at a stop-action photograph of any point on this surface, its associated vector informs about where the system would take it over the next unit of time. The whole surface can be marked by initial points, which the dynamical systems move as they generate patterns of orbits of moving arrows in time. The following two brain and behavioral experimental circumstances make this depiction and its relevance to dynamical entropy more concrete.

We review in more detail the concrete and visualizable findings from experiments requiring the quantification of characteristic patterns of motion in animals and man. They can be embedded into a similar surface-like setting, which might be called a *behavioral manifold*. For examples, my students from the past, Martin Paulus and Mark Geyer, now Professors at the Medical School of the La Jolla branch of the University of California studied the effects of psychotropic drugs on the patterns made on the floor by rats of various genetic strains while they wandered about, in *exploratory behavior* in a bounded space. Monitored by a video camera placed above the ceiling less cages, the patterns made by the paths taken by the rats over time were reconstructed as *vectorial orbits on a behavioral manifold*. This manifold was then repeatedly *partitioned*, *covered* with, from just a few large, in graded progression, to many smaller boxes, each partition composed of rectangular lattices of a particular size. Units of time were also partitioned into range of units from larger to smaller durations of observation. Differences in the rat's *genetic strain* as well as injections of *stimulants, antidepressants* or *antipsychotic drugs* resulted in characteristic and discriminable path geometries mapped onto the behavioral manifold as orbital patterns. Each path was encoded as a sequence of size-dependent numbered boxes that were entered and occupied

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or left. The new information being generated by the pattern of spatial orbits took the form of sequences of numbers or symbols representing the sequence of labeled boxes. The complexity of these numeric or symbol sequences was then quantified in a variety of ways including the use of *two fundamental measures of dynamical entropy*.

One measure reflects how many new, previously unexplored boxes were entered by the rat per unit of time. This rate represents a percent of the *possible*. The second measure reflects how much of the time did the rat in each box visited as a distribution of the *probable*. The *rate of expansion of the possible* and the *relative time in occupancy of these possibles*, *the probables*, form the bases for the computation of these *two kinds of entropies*. For example, the work of Paulus and Geyer showed that the administration of a very small amount of stimulant drug, compared with a salt water control, led to an increase in the first measure of the number of new, previously unexplored, boxes entered per unit time. With respect to the second measure, the stimulant drug augmented exploratory activity was also more uniformly distributed over the possible boxes, making for more uniform probability. Administration of higher doses of stimulant drugs, at a critical dose, led suddenly to more spatially and temporally restricted and stereotyped patterns of motion of the rats, compulsive circling alternating with frozen sniffing. Both contributed to a *decrease in the possible* and *nonuniformity in the distribution of the probabilities*. In man, low doses of amphetamine tend to increase the rate and creativity of thought streams and high doses generate fixed ideas and paranoid delusions. In the statistical approach to nonlinear dynamical systems, time-dependent *generation of new possibilities* is called *topological entropy*, H_T and the entropy associated with the *distribution of probabilities* is called the *metric entropy*, H_M. These kinds of entropies have also been used to quantitate characteristic patterns of in human behavior as well.

We have previously mentioned these measures as used in human experiments by Karen Selz, a Research Professor of Psychiatry at Emory University in Atlanta. Recall that she devised a set of experiments leading to unobtrusive measures made on human subjects by asking them to remove, as many as they

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could, the dots in a lattice, one by one, from the computer screen, by clicking on each point with a mouse. In some experiments, after removal, the dot reappeared in fifty milliseconds, in the "fast return condition", or after one-second delay in the "slow return condition." Unbeknown to the subject, the path made by the motions of their mouse on the computer screen over time while removing dots were reconstructed as a path on a fine to coarse grained box-partitioned behavioral manifold. Entropic indices of the rate of expansion of the possible, number of new boxes entered, reflecting H_T , and the relative occupancy of the partition of the possible, reflecting H_M, the distribution of probabilities with respect to the boxes, could then be computed. For examples, Selz found that the spatial and temporal patterns of computer mouse motions made in this dot search and destroy task correlated highly with the subjects' age, sex and personality types as defined by profiles from the Minnesota Multiphasic Personality Inventory, MMPI, and the Structured Clinical Interview, SCI, associated with the standard Diagnostic and Statistical Manual, DSM IV. She found that subjects whose personalities were like my high self-sensibility girlfriends demonstrated high indices of both H_T and H_M.

The actions of *nonintegrable* nonlinear differential equations, not solvable by the usual techniques of integration, can be transformed into graphical images by plotting their orbits in abstract *phase spaces* with the three physically measurable coordinates of *location* x (or some other temporarily fixed *value*), *velocity* y (the rate of change in the location or measured value) and z *acceleration* (the rate of change of the rate of change in location or value) in *x, y, z space*. Graphical representations of the system in action *in phase space* can serve in place of analytic solutions to the equations. This idea was one of Henri Poincare's major contributions to mathematics and physics, and has come to be the centerpiece of the *qualitative theory* of *differential equations.* The often point-to-point unpredictable but globally and qualitatively characteristic geometric shapes of the orbital patterns in abstract *phase space* are the objects of interest. There are visualizable representations such as cycles as circles and statistical measures made on these objects such as the H_T and H_M entropies and the *in-betweenness* (neither maximal nor minimal) of their difference.

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A global statistical context for these qualitative differential systems was inspired by the Russian mathematician, Andrei Nikolaevic Kolmogorov. In his now famous foundational talk about the stability of *classical mechanical systems* in the final session of the 1954 International Congress of Mathematics, he gave public birth to, among other ideas, what has come to be called the *ergodic or statistical, measure theory of dynamical systems.* Here, *ergodic* means the existence of an *invariant statistical measure* on the phase space attractor of the system that can be obtained using a variety of equivalent methods and beginning the count at any of its points. Two phase space objects generated by a dynamical system may look different in phase space but their statistical measures may all be the same, i.e. *invariant*. These qualitative orbits in a box-partitioned space can be visualized as Paulus and Geyer's rats exploring a space and Selz's path sequences of computer screen dot quenches produced by clicking on them with a computer mouse.

A precursor of Kolmogorov's *ergodicity* was the earlier ergodicity of Ludwig Boltzmann. This describes a *suitably partitioned* system such that *equivalent values* come from quantitating the behavior of *one single orbit* exploring the space of the lattice of boxes over very long times time as those obtained from a single aggregate photograph of *all orbits run from all possible starting places simultaneously*. The ergodicity of gas-like molecular randomness implicates systems being in one of only two possible equilibrium statistical states: *measure zero* (at most occupying a single point, zero, *minimal entropy*) or its "complement," *full measure one* (occupying all available space in a state of *maximal entropy*). Joseph Goldstein, a well known teacher of meditation, giving advice recorded in Daniel Goleman's 1977 book on the subject said that all methods of nirvana directed meditation amounted to "...simple mathematics ...all systems aiming for One or Zero—union with God or emptiness." In place of the maximal or minimal values for the H_T and H_M entropies of these states of transcendence, we in the world of *samsara* are stuck in states of in-*between entropy* which *invariant statistical measures* of on *phase space shapes* help quantify.

To generalize measures made on rat and computer mouse paths to more general and idealized systems, after plotting an *orbital path* in a *phase space*, we

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may *partition* the space of values taken by the journey of the orbital action generated by the equation over time with rectangular grids of increasing fineness. The result is an *equipartition* of phase space such that there is at most one orbital point in each rectangle of the grid, with, of course, many rectangles in the finer grids being empty. This final grid partition is called a *generating partition*. The proportion of the available boxes of the partition occupied by points is called its *area* or *volume measure*. This measure has been given a variety of names including *Liouville, Haar and Lesbegue measures*. If every box is occupied, it has *measure one*. If at most one box, it has *measure zero*. If we allow partitions to be non-uniform and/or not fine enough to be generating and apply probability weightings for how many points fall into each particular box of the grid, the method is called the *Sinai-Ruelle-Bowen* or *SRB* measure after Kolmogorov's students and followers, the Russian, Ya Sinai, the Belgian Frenchmen, David Ruelle and the American, Rufus Bowen.

Similar to the *SRB measure*, the distribution of box occupancy probabilities multiplied by their logarithms and summed over all cells of the partition yields a statistical measure that is close to the *informational entropy* of Claude Shannon as described above. It is called the *metric entropy* ($H_M = -\Sigma(\rho_i \ln(\rho_i))$, where H means entropy and ρ_i is the proportion of the total observations that occupy cell i of the phase space or state space partition. It was the above noted Russian father of modern dynamical systems, Kolmogorov, who in 1956 proved that the *Shannon metric entropy is a quantifiable invariant of systems even in very complicated motion.* Stanford University's Donald Ornstein won a Field's Medal (the under forty year old mathematician's Nobel Prize) for his late 1960's work proving that the Shannon *metric entropy*, H_M, was the only invariant for a large class of appropriately defined, *expansive* (near by points separating in time) dynamical systems. Recall that we refer to *metric entropy* reflecting the relative occupancy as *probability* among the *possible* boxes (or states) as H_M. H_M is maximal when the percentage occupancy of all occupied boxes is uniform.

IBM's Roy Adler in New York and Brian Marcus in California, Hebrew University's Benjamin Weiss, Warwick University's English mathematicians, William Parry, Peter Walters, Mark Pollicott and others developed and proved the relevance

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of a related measure of the rapidity of dynamical expansion, the generation of new information seen as the rate of entering new boxes of the partition, a logarithmic rate of expansion of the *possible*. Counting the number of previously unoccupied squares entered by the dynamical systems orbit per unit time over the generating partition, for instance, yields an estimate of entropy that, as in the rat and computer mouse examples above, is called the *topological entropy*, H_T. H_T, is about how much new information is being generated by the system per unit time. Theorems have been proven that *H_T is a maximal estimate of the global dynamical entropy with H_M proven to be a minimum estimate.* Monitoring single or aggregate molecular motion in a system with the *maximum randomness* of a space filling gas, we find that, on the average, every box is entered and occupied uniformly such that $H_T = H_M$ or said another way, $H_T - H_M = 0$.

As evidenced by the above described experiments in rats and people, the same entropic relations (but usually not with maximal or minimal measure) can be found in biological systems. We have previously described the manifold geometry of a generic (typical, idealized) nonlinear dynamical systems as *hyperbolic* defined by the presence of simultaneous but decomposable components of the motion including the straight ahead and round and round actions on the center *manifold*, the new possibility generating, expansive, away from the center manifold motions along *unstable manifolds* and the back to the center manifold, contracting motions, along the *stable manifolds.* Uniform expansive and contractive influences in the flow leads to *mixing of the order of the initial sequence* of the values inscribed by the orbits. This results in maximization of the entropies and satisfaction of a concomitant of the uniformly hyperbolic condition, $H_T - H_M = 0$.

These clean and mathematically proven findings do not hold for the quasi-mess that is human neuropsychobiology. Enmeshed as most of us are in only *intermittently random* or *nonuniformly hyperbolic systems* with the *in-between entropies* of the only apparently real world of *maya*, $H_T - H_M \neq 0$. How the $H_T - H_M = 0$ of uniform hyperbolicity fails, $H_T - H_M \neq 0$, and along with it the dispassionate detachment of entropic emptiness and fullness, becomes a problem not unrelated to the existence and quantitative qualities of personality styles and their dissolution

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with return toward but not reaching the maximally entropic openness, flexibility and naïve credulousness of the in Jesus and Holy Ghost occupying transcendent dynamical states. We are all stuck somewhere in the range of measures indicating *in-between entropies.*

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CHAPTER 5:

SOME ENTHEOGENIC ENTROPIES

In the spring of 1968, members of my laboratory team were looking for new brain metabolic pathways of the essential amino acid *tryptophan*, the dietary precursor of the human mood, sleep and libidinal neurotransmitter, *serotonin.* After struggling for several months to identify an apparently new compound, which turned out not to be new but only new in the brain, we collected evidence for a human brain enzyme that could catalyze the production of an LSD-like hallucinogen, *dimethyltryptamine*, DMT. Tracing its metabolic origins, we found that DMT was derived from tryptamine, a common metabolite of the essential and omnipresent amino acid, tryptophan. This enzyme and its metabolic product were located in highest concentrations in brain stem systems that influence the neural regulation of the heart, blood pressure, temperature, breathing, vomiting and primitive approach-avoidance behavior. It was also found in limbic brain nuclei thought to modulate the emotional coloring of perception and thought. Richard Wyatt, working at the National Institutes of Mental Health found DMT in the urine of schizophrenic humans. He also showed that DMT increased significantly if tryptamine's normal pathway for degradation was blocked by *monoamine oxidase inhibitors*, such as

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Nardil, Marplan, Eutony, Parnate and others of a then common family of antidepressant drugs.

The presence of a DMT-generating enzyme in human brain was particularly exciting because we knew from the work of Harvard botanist, Richard Shultes and others, that DMT and the monoamine oxidase inhibitor, *beta carboline,* are combined in a mixture of the leaves of a shrub and the bark of a vine, both Amazonian plants, used together by the *shaman* of Peru, Colombia and Ecuador for thousands of years to evoke mystical experiences in themselves. In their state of chemically-facilitated, spiritual transformation, they were better able to engage in healing and divination of others. More recently this and other similarly acting biochemicals have been called *entheogenic,* "connecting to the sacred within."

Consistent with our neurochemical findings in human brain, the shamanic concoction, called by many names including *ayahuasca* and *yage*, combined the DMT containing plant, *Psychotria viridis*, with an extract of a vine with the powerful monoamine oxidase inhibitor properties of the *beta carbolines* found in *Banisteriospsis caapi.* In 1975, working with a graduate student, Louise Hsu, we found that the mammalian brain could also synthesize *beta carbolines*. This family of compounds from the vine protects the tryptamine substrate as well as DMT from metabolic degradation such that it could circulate in the blood long enough after oral ingestion for enough to cross the blood brain barrier to induced prolonged and dramatic alterations in perceptions, feelings and thoughts. In addition, the *carbolines* of the *Benisteriospsis* component extended the time of action of DMT beyond the 15-30 minutes of effect of DMT when injected alone in human subjects. We found it fascinating that the human brain made combinations of DMT and *beta carbolines* similar to the blend that indigenous shamamic chemists discovered as an entheogenic from plant sources.

Ralph Metzner, in the introduction to his 1999 collection of papers called *Ayahuasca* concluded that "...it is widely recognized by anthropologists as being...the most powerful and most widespread of the shamanic hallucinogens." William Burrough in a 1953 City Lights published book written with Allen Ginsberg, *The Yage Letters*, said that *yage* "...gave entrance to a city where all human

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potential is spread out in a silent market..." It was generally believed that with adequate spiritual preparation, *ayahuasca* could generate transcendent states that allowed access to ones inner being and the beings of other worlds that could serve as sources of mystical knowledge and healing. The *Shams dervish* of the 13th Century, wandering the Turkish portion of the Silk Road, used the word *sohbet* to describe the inner land of *mystical conversations about mystical subjects* that their *turning meditation*, whirling, and the shaman's entheogenic compounds such as DMT give entrance.

The question was whether our finding of DMT and its human brain enzyme had been an artifact, an accidental laboratory fluke. Members of my neurochemical research teams at the University of California Medical Schools in Irvine and La Jolla, notably Dr. Lee Poth, now a professor of pediatric endocrinology at the Uniform Services Medical School in Washington D.C., demonstrated that the DMT synthesizing enzyme existed in the brains of recent accident victims that as far as we were able to learn from their family and social histories, had been completely psychologically normal. More than a little bit startled by this finding and worried about making a sensational scientific mistake, we repeated the experiments with a variety of controls with the same findings. Though our original estimates of the human brain enzyme concentration were on the high side, we confirmed the general finding and published them in *Science* in 1969 and *Nature* in 1970. Our carboline work was published in the *Journal of Neurochemistry* in 1975. A year or so after our *Nature* paper was published, the Nobel Prize winning neuropharmacologist at the National Institutes of Mental Health, Julius Axelrod, confirmed the presence of the DMT biosynthetic enzyme that converted the tryptophan product, tryptamine, to DMT in mammalian brain tissue. We were both delighted and relieved.

We speculate, perhaps too grandly, that this finding, along with the *beta carboline* human brain synthesizing capacity, supplies one of many possible neurobiological and neurochemical mechanisms for the claims of the cross-cultural universality of mystical experience. We all had human brains with these enzymes. The idea that the phenomena accompanying primary religious experience were common to all cultures was a major theme of the life's work of the philosopher-

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psychologist, William James, and was studied using fieldwork by anthropologists such as Bronislaw Malinolowki as described in his classic book, *Magic, Science and Religion.* Was this neurochemical-behavioral organization an evolutionarily adaptive mechanism selected so that some spiritually gifted individuals self-selected from a severely stressed population could escape and then lead the rest of us out of a sense world that had become intolerable? Could this be an antidote for the hopeless, without materialistic solutions and trapped in a belief system of spiritual nihilism? Was this a brain chemical transcendence escape and spiritual delivery system for the suprapsychological survival of those in dire need? As the 13th Century Islamic mystic, Jelaluddin Rumi, has written, "If a tree could fly off, it wouldn't suffer the saw…" and more concretely, "…if you can't go somewhere, move into the passageways of the self…," a spiritual escape via a neurobiological road to the God-space within.

What followed were a few years of occasional exploration of an "inside out" understanding of the mystical states evoked by the entheogenic family of chemicals. There were varieties of settings for these personal experiments. I found myself LSD-lost, circling endlessly in the tall silence of a Northern California redwood forest. I tried on Hunter Thompson's *mescaline* lenses for the experience of Las Vegas unfiltered. I was expertly mentored in these quests by a distinguished collection of guides: Cultural anthropologist Michael Harner who taught me about the *yage* and *datura* use among the shaman of the *Jivaro*; Social anthropologist, Barbara Meyerhoff introduced me to the personal renewal rituals of the *peyote cactus*-using *Huichol Indians* of the Southwestern Sonora Desert; Neurochemically sophisticated Sidney Cohen, founding director of the National Institutes of Health's Institute on Drug Abuse, told me stories of his involvement with Aldous Huxley and Barbara Brown in the Los Angeles covey of early American LSD explorers; organic chemist Albert Hoffman, Sandoz's designer of a series of ergot alkaloids including LSD, told me stories of his accidental post-sniff hallucinations while returning home on a bicycle; An anonymous group of us conducted personal experiments with Sacha Shulgin, the University of California at Berkeley professor who first synthesized and tested the mescaline-derived, *Ecstasy* series of compounds; We

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did some work with the dissociated anesthesias (producing wide awake but not there states) having consulted with John Lilly, a brain scientist who used these agents as a courageous self-medicating explorer of sensory isolation tanks; I met several native shamanic practitioners including the Huichol Indian that was the model for Don Juan in Carlos Castanada's five volumes of pseudoethnography written up in my essay "Is Don Juan Alive and Well?" in *The Pushcart Prize of 1977*. Issues of culture and brain chemistry came together in several accounts about entheogenic, mescaline-containing peyote use among the Huichol Indians in a book edited by Kathleen Berrin and Thomas Seligman of the San Francisco Art Museum called *Art of the Huichol Indians.*

Over these years I collected many nauseating, upper and lower bowel wrenching and ecstatically transcendent and exhausting day-long episodes of the angular geometries of visual pattern-generating DMT, the animistic breathing of bush and flower breathing peyote cactus, the darkly forbidding shadows of the psylocybin-containing mushrooms, the irreversible rocket launches into the electrically buzzing, kaleidoscopic circus of LSD-containing vials from Sandoz and the optimistic, trust engendering, expansively warm rush of six of Sacha Shulgin's gregarious, rave dancing, chlorinated, methoxylated and ethoxylated phenylethylamines which he had, years before, synthesized for "an undisclosed purpose" for the Dow Chemical Corporation under contract with the U.S. Army Chemical Corps. The best known of the latter group remains part of the *rave culture* as *Ecstasy.*

These agent's peaks are flooded with exaggerated, caricaturizing images of people's faces and a belief in the *mindedness* of animals and even the *embodiment* of inanimate things. Evoked are simultaneous and diametrically conflicting interpretations of the same social context, *heteromodal sensory fusi*on called *synesthesia* so that sound bespoke color and smells induced music, habitual thoughts rearranged as new ideas in what is experienced as exciting new insights, and, most of all, that which Louis Lewin, Berlin's early 20th Century Freud of psychotropic drugs in his book *Fantastica*, called *gladness of the soul*. Timothy Leary wrote of entheogenic escape from the habitual human brain's *mental-*

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manipulative and *socio-sexual circuits* gaining access to the rapture and ecstasy brain pathways on the way to the *new planet within*.

What is seldom written about is the aftermath of chemical entheogenic agents. After the several hours of fireworks, all of these entheogenic agents, some more than others, gifted me with weeks to months of more self-sufficient, emotional fullness and ease in the conduct of living that was less contaminated by narcissistic preoccupation or defensive distantiation. I was left with increased interpersonal sensitivity and a noticeable repair of my deficiencies in aesthetic sensibility, particularly for the visual arts and landscapes. What were once two dimensional, trivial, beside-the-point, scattered copses of trees and apparently casual arrays of plant life in the Boboli Gardens behind the Palazzo Pitti in Florence, became the grandly structured, botanical wonder of increased dimension, communicating awe filled new perceptions of its previously unseen beauty. For the first time, I found myself walking slowly and stopping for several minutes, wordless, spellbound, in front of the modern art pieces of New York's Guggenheim Museum. Lost in the experience, I found myself exclaiming to no one in particular, "I can see!"

The delicacy and deliciousness of post-entheogenic agent's new and beautiful everything made me tiptoe watchfully so as not to injure an ant. Feelings of omnipersonal kindness and generous compassion were without prideful self-reflection. This state of grace felt like an invasion of a shimmering presence that made contact with my other, generally unknown to me, life. It brought new perceptions, feelings and ideas for which I was moved to give thanks. I began to think I understood a little bit about what was meant by *living in the Spirit* and *merging with God*. Mircea Eliade, the French, University of Chicago Professor of the History of Religions, in his classic *The Sacred and Profane*, calls the revelation of the sacred in ordinary objects, people and events an *hierophany.* In the state that this requires, "…all nature is capable of revealing itself as cosmic sacrality…." The entire world can become a hierophany with what Abraham Abulafia called an *activated mind*, the Jewish soul of emergent properties called the *Nefesh.*

This entirely new world, Rudolf Otto in his 1917 *Das Helige* (*The Sacred*) called it *ganz andere,* (wholly other, something else), seemed to emerge

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spontaneously along with an instantaneous knowing-how-it-is-with-you-and-I-and-all-of-us that made even vicious killers appear sympathetic. Is this what the Charismatic New Testament Book Churches mean by redemption through forgiveness of others, requiring the genuine sincerity of this thought before qualifying for Communion? Is this Christ's undemanding gift of grace as in *Romans 4*: where Paul observed that all of us fall short of the full glory of God unless justified freely by His grace. Was this the New Testament's spiritual technological advance from the Old Testament's and Koran's eye-for-an-eye? Did this chemically triggered transcendent experience differ significantly from the supernatural transformation of individuals by the Holy Spirit of Christian revivalist teachings? Martin Marty, University of Chicago's Professor of Modern Church History, dates the institutionalization of this personal transformation in the United States to the post-Civil War period. Did this mean that the mysteriously selfless love of Christian agape and the altruism of E.O. Wilson's sociobiology lay waiting in the brain and could appear spontaneously, by grace, without lawful directive, repetitive recitation or the discipline of catechism?

As one might have suspected, the urgency of my inner and outer search for a new spiritual ecology of mind was driven by more personal needs. My spiritual hunger was made acute a couple of years before our laboratory's DMT discovery when as a 30 year old Assistant Professor of Psychiatry and Neuroscience at UCLA in West Los Angeles, I was living in a small, heavily mortgaged house in Brentwood with my graduate student wife and two young sons. A testicular lump was an accidental discovery made while showering. After surgical biopsy and radical lymph node dissection, the professor of urology gave me a diagnosis of right testicular choriocarcinoma. All by itself, my testicle had given birth to a mass containing all the embryological tissues of a fetus, and had thrown in some maternal placental cells as lagniappe. Unlike now, when the group of testicular neoplasms are treated successfully with a high survival rate (think Lance Armstrong), at that time, follow up research of this young man's disease by the Army Medical Corps promised a five-year survival rate of only 5% to 10%. The news filled me with fear and the ensuing hopeless resignation detached me from life with a dread broken up only by

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episodes of rageful envy of everyone else in the world that had been spared. My wife escaped into an alcoholic flirtation with her major professor; my sons grew increasingly ensconced in the generous and kind neighborhood homes of their playmates. I metered as many hours as possible in equity growing, long lonely days in a small, dark, couch filled, university office, listening to Beverly Hills, Brentwood and West Los Angles citizens as they psychoanalyzed their mysterious lack of emotional fulfillment from materialistic fulfillment. Legend has it that Gautama's sudden insight about the universality of this sated, bored condition occurred in 528 B.C. after 49 days of sitting in the lotus position under the bodhi tree, now called *ficus religiosa.* In contrast with Buddha's illumination, my psychoanalytic training-induced, Freudian-Darwinian instinctual conflict, driven by fears of starvation and castration, drew me tighter into the world of meaningless, coin flip probabilities.

Our house was a block away from a West Los Angeles synagogue and we knew the Rabbi and his family well. Our sons played together frequently. The Rabbi tried to bring comfort to me on my death watch, with hours of discussions about trans-individual, ethnic belonging and a deeper foray into philosophical humanism. Both felt completely irrelevant to my condition. As an intern tending to those dying at night in Ochsner Foundation Hospital in New Orleans, it seemed to me that Jews tended to die more noisily than Catholics. For my personal escape from low-lying dread, I needed the metrically linear time of *chronos* to become the metric-free, topological, *continuous surface* of the *twisted circular ribbon of a Mobius loop*, with the view from each moment a *kairos*, a stretchable infinity of each moment's internal multiplicity of times.

The ruthlessly reasonable Hebraic historicity, configured by the tooth-for-a-tooth, Mosaic and Roman *talion law*, the reciprocal, economic, exchange-calculating brains of Barkow, Cosmide and Tooby's *The Adapted Mind* (*1992*) and the terrifying stories of the *Five Books of Moses*, made the hopelessness of this sinner's plight inevitable. It felt like my dichotomous choice of God-type was between One of merciless fairness and the He and She of unconditionally forgiving generosity. The mind set of logical problem solving applied to the question about which of these two represented the true character of God lead to a momentarily distracting, metaphoric

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ecclesial exercise: *what were the minimal number of four magical cards need we turn over with preconditions or results on the upsides and downsides if what was showing was*: (1) Beatifically good; (2) Cursed with extraordinarily bad luck; (3) Not dependent upon personal virtue; (4) Inordinately fortunate in all of life's trials. The pay-as-you-go God people would need to pick up (1) and find fortunate life and (2) to find the fate of the non-believer to establish that God was coldheartedly true and fair with the results of flipping (3) and (4) being none contributory. The grace-to-all-sinners God people need to turn over card (3) to find good life and (4) to find sometime sinners nonetheless fortunate to confirm their belief in the unconditionally of the loving generosity of God and making finding out about the underside of cards (1) and (2) unnecessary. This liturgical discussion and gamble with God's cards, perhaps a caricature of the Talmudic, rational discussions with the rabbi, felt irrelevant to my spiritual needs.

Missing was mysticism's promise of the disappearance of I into a union with the divine, the *Heart Sutra's* eternal *emptiness of form* and the *eternal form of emptiness* that gifts with spiritual perspective and not-necessarily-logical intuition about unseen *Absolute Reality*. Forced either-or, binary, card-turning cognition in the search for God's logic is unrewarding. As the Dalai Lama, in his *Heart of Wisdom Teaching*, says, "...all phenomena are emptiness, without defining characteristics, they are not born, they do not cease..." In trying to penetrate the mystery and promise of this emptiness, it was difficult to surrender my internal parody of what sounded like that day's Southern California New Age stuff about global nonaggression, sexual politics, Beadles music, distressed jeans and pot. In the synagogue of my neighborhood, experience with a deeply felt, never-you-mind-about-anything God of detachment with love, was not on the menus of Friday night or Saturday morning services. All I could feel was a faithless and nonnegotiable fear.

In the work of many mysticism-positive scholars, a classic being Evelyn Underhill's *Mysticism, 1961,* it has been speculated that this ineffable state as a union with a powerful unknown, transcending description in language, becomes more socially prominent during times of cultural efflorescence. She pointed to the

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flowering of mysticism in epochs of the high cultural achievements at the close of the Classical Period in the Third Century, the Medieval Period in the Fourteenth Century, the Renaissance in the Seventeenth Century and, now, as we know, in the Western World toward the end of the Twentieth Century. An increase in general acceptance of talk, writing and practice focused on mystical experience is said by many to accompany historical high points in intellectual, literary and political achievement. One might include as a component of our growing cultural richness, the new science about chemical dialogues with the brain. Although no central nervous system agents were ever allowed in the ashrams of Baba Muktananda, it was common during some evening sessions of questioning, called *satsangs,* for him to acknowledge that one or a few experiences with entheogenic agents can open many recalcitrant folks to the existence of the God within. This, in turn, led them to the drug free spiritual exercises, *sadhana*, of *love, self-truth*, and *spontaneity* (each according to their nature) as well as *abstinent discipline*, *meditation*, *chanting* and *yoga* to maintain the knowledge. We might speak of participating in the creation and maintenance of the spiritual ecology of ones inner and outer being. Underhill said that the cultural richness of an efflorescent epoch is *taken inward* and accompanies personal and societal mutations into states and institutions involving higher spiritual consciousness.

In addition to an increase in the common outward manifestations of having had a mystical experience, such as an increase in compassion, forgiveness and more respectful and reverential attitudes toward the Earth and all its creatures (currently taking the forms of *deep ecology*, *ecofeminism*, *herbal medicine*, *organic farming* and the like), these times bring more public consideration of the nature of reality itself, apart from its material manifestations. The theme of the life's work of the Dominican priest, Thomas Aquinas, made master of theology by papal dispensation in 1259, involved the existential recognition of this dichotomy of existence, *esse,* and *essence*, nature and grace, the material world and God. William James wrote famously about mystical experience penetrating the *thin veil* between these two worlds. Those with a mystical orientation attribute reality to inner experience in relationship to a transcendental, supernatural world. Whereas

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everyday events are subject to perceptual ambiguity and its attendant variety of interpretations, mystical union is claimed to bring the existence and meaning of *Absolute Reality* into direct experience. This kind of knowing is more akin to the *Platonic view of mathematics*, that theorems have been everlastingly existent, from before our physical world, then it is to the here and now, physically based, finite computations involving the experimental machines of physics.

The philosopher-mathematician father of *phenomenology,* Edmund Husserl, criticized the physics-want-to-be orientation of the 1860 empirical, objective measure psychologies of Fechner and Wundt. He understood the best of their findings as simply correlations between subjective and observable events. Using mathematical discoveries as examples, Husserl spent his life arguing for the possibility of abstract truths relevant to mind being more reliable and valid if grasped via direct experience. Knowing by what the popular mid-twentieth century writer of science fiction, Robert Heinlein, called *grocking it*. This is antithetical to the attitudes of today's human *cognitive and brain sciences* which disallow such knowing as deeply suspect unless accompanied by objectively definable observables such as changes in *electrical or imaging indices of brain activity* in one neural region or other. The modern psycholinguistics of brain mechanics can be called *neolocationism*. Using modern technology to measure *regional blood flow*, *energy metabolism and/or electrovoltage or magnetic field activity,* stories of function are spun that closely resemble those imagined more than a century ago by the first *locationists*, such as Ramon Cajal. These neuroanatomists spent thousands of hours looking at cell clusters and their connections in stained slides of human brain tissue using microscopes and imagined their singular and integrated function.

Today, Lewis Judd, long time chairperson of the Department of Psychiatry at UCSD in La Jolla, carries a full sized, polymeric, three-dimensional model of the human brain when teaching his students about human subjective experience and interpersonal behavior. In his weekly grand rounds, he explains that day's psychiatric patient's problems pointing here and there at regions in this plastic surrogate for our electrical jellied brain. Few, if any, of the psychiatry students in his class was inclined to ask the foundational question: how it is that a finger point and

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a name of a brain place can describe, much less explain in the language of physical or physiological mechanism, a patient's illogical thoughts, feelings of hopelessness, irrational rage or prayerful gratitude. There remains a wide gap between ideas about the mechanisms of human symbolic processing and those involving the structures and functions of neuronal components and their connectivities in the brain, particularly when perceived as regionally segmented meat. Yet this report of Professor Judd's finger-pointing plastic brain ritual should not elicit surprise since iconic manipulation is certainly not new to the practices of priesthood.

In contrast with neuropsychiatry's behavioral attributions to brain parts as an explanatory pantheon of mysterious doers, absent of mechanical specifics, the fields of physics turn to more abstract and general mathematical and statistical, so-called *phenomenological laws*, such as those of *thermodynamics* and *statistical mechanics*. The accounts of Feynman's abstract and general thermodynamic development of *conservation of energy* as well as *equilibrium thermodynamics* discussed previously serve as relevant examples. These abstract models have been found to capture the behavior common to diverse physical systems involving (often still unknown) differing physical mechanisms. Consistency of description, *reliability*, weighs in before predictive *validity*, which, with maturation of the research area, gradually becomes detailed mechanistic understanding with the eventual goal being derivation from the *first principles* of physics. The painful truth is that that in spite of evocative claims made to the contrary in the 1990-2000 *Decade of the Brain*, this level of understanding at the interface of neurobiological hardware and software remains unbreached. Some recent attempts are interesting.

One of the current research themes about real single neurons in real brains (in contrast with the silicon chip modules used in *neural network computer simulations*), involve widely distributed neurons that discharge in *temporal synchrony*. These phenomena have been described by Max Planck's Wolf Singer, Christoff Koch of California Institute of Technology and Florida Atlantic University's Steven Bressler and others with words such as *synchronization, phase locking, coherence* and *binding. Binding* is an intuitively seductive word that premises that two, even widely spatially separated, brain regions that manifest neuronal signals of

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activation locked together in time are assumed to be functionally integrated. Another time-dependent neuronal characteristic of current interest involve neurons or neuronal clusters that beat with almost strict periodicity, the *oscillatory pacemakers*. For example, the program of research by Professor Al Selverson at University of California at San Diego, among others, has elucidated the role of these *rhythmic pattern generators*, both autonomous and those emerging from particular patterns of network connections. A wide variety of functional links involving *neuronal pacemakers* has been demonstrated. They range from the *oscillatory transport of calcium* through *membrane channels* in neurons and heart muscle, *smooth muscle oscillations* of the pylorus muscle of the stomach, the neuronal ganglion driven chewing motions of the jaws of invertebrates and the retina-to-brain *hypothalamic cells* gating *human circadian rhythms* coupling our body's *hormonal clocks* to *light cycles*.

Though *regular rhythmicity in neuronal discharges* is an intuitively attractive idea and relatively easy to quantitate using simple *sine wave trigonometric transformations*, in the real brain it is statistically rare. The commonest neuronal discharge pattern observed is that of *intermittent bursting*, *clusters of neuronal discharges in time* in which the *inter-discharge intervals irregularly stretch and contract* like the bellow pleats of a syncopated accordion. Bursts of repeated firing of some unpredictable length followed by silences of equally mysterious durations. Their behavior can be represented as statistical measures using non-normal, *long tailed distributions* and *in-between entropies* described previously. For a whole human example, although the rhythm of *manic depression* is commonly thought to involve *periodic cycles*, careful study using *motility patterns* of the timing through life of these episodes of extreme mood states by Professor Allan Gottschalk at the University of Pennsylvania and others have demonstrated an irregularly *intermittent bursting pattern* in manic-depressive episodes, getting more frequent with age. Neuronal inter-discharge intervals seldom demonstrate what is called a *regression to the mean* like the *normal distribution* of heights, as one increases the number of people measured, the tighter the distribution around the mean. Neurons, much like our own irregular pattern of doing things (in spite of our plans), the statistical

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distributions of neuronal interspike intervals have increasingly *long tails*. Contrary to the behavior of a *normally distributed observable*, the larger the series of neuronal spike observed, the more likely that a longer interspike interval than had been seen before will occur. Counter-intuitively, long intervals tend to be followed by more long intervals as more shorts follow short intervals. Manic attacks cluster in time as does a number of other brain and body diseases. Maybe it is intuitively obvious that bad stuff tends to cause more bad stuff and good stuff is self-propagating. Having suffered recently does not mean fate owes you one. The brain's syncopated segmentations of time can be translated into a creatively arrhythmic dance.

What makes *neurologizing conversations* like these about subtle human experience possible are the human subjective scenarios we have agreed to short hand with names of brain parts and neurochemicals. The *how* is *where* conceptual connection is filled with post 19th Century Spanish microscopic neuroanatomist, Santiago Ramon y Cajal-like, intuitions about the functional role of brain structures: we think motor automaticity and pacing when hearing the brain place names such as *caudate, putamen* and *cerebellum*; we think *limbic lobe* when musing about sexuality, rage and depression; we short hand *left versus right hemispheric places* for *verbal and sequential versus intuitive and geometric shape cognition;* we point to the *frontal lobe* for the future work of *executive control, anticipation and paranoia*; the *hypothalamus* for primitively expressed *appetites* and to the *brain stem* for our *vital functions* such as *breathing* and *blood pressure*. With respect to the brain juices, we say *dopamine* for *aggressive activity*, *norepinephrine* for *attention and sensory discrimination* and *serotonin* for *hunger, mood and sexual inclination*. No matter how avant guarde our experimental techniques such as monitoring local functional blood supply by *fMRI, regional brain glucose utilization maps,* time-dependent changes in skull surface voltage using a cap studded with electroencephalographic, EEG, leads, monitoring these voltage field via their transverse magnetic fields by the frozen helmets of *magnetoencephalography, MEG*, we conclude our work by calling forth named but still enigmatic brain parts and their juices as mysteriously powerful little men and women executing remarkably complex and subtle tasks, sometimes even when called upon.

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Current neurochemical research using molecular biological tools such as mice knockouts (the ablation of specific proteins though interference with their nucleotide-mediated protein biosynthesis), for example, the production of animals missing a subunit of their *hippocampal glutamate receptors* associated with the loss of some memory functions, conclude the memorial mechanism to be a specific cellular region, such as *hippocampal CA3 cells.* Technology advances but continues to support a primitive philosophic animism of named brain parts which pop science icons like the late Francis Crick called "The Amazing Hypothesis." He and his fellow brain philosophers implicate brain mechanisms such as the *amygdaloidal nucleus man* who can *emotionally color* even affectually neutral information that is transported through him. Imaging data showing *amygdala man* lighting up is used to tell us that circulating sensory information through the differentially behaving *amygdaloid nucleus* is used for *fight or flight* interpretive significance. Emotionally expressive human faces light up *inferior parietal cortex*. The Iowa University Professors, the husband and wife Damasios, have located even the criminal psychopath man in specific locations in the brain. As we have argued, perhaps *ad nausem*, using multimillion-dollar imaging and molecular biological technology and no new thoughts that weren't around during the era of the 19th Century's neuroanatomists, specific brain regions continue to gain implicative properties like the task-specialized gods of the Roman and Greek pantheons. Crick implied that God is a brain part.

At the same time, those of us that have been in the brain business for a while, recall skyscraper window washers, standing steady, high up on rope lashed planks, suffering from congenital absence of the *cerebellum*, the supposed *sine qua non* brain part supporting motor coordination and balance in humans. More generally, there is much evidence that if young enough and willing to work, many of the functions of missing parts of the brain can be taken on remarkably well by other brain parts thought not to be involved in these functions at all. In addition, since evidence of neuronal responding to loud noise or bright light perturbation can be found almost everywhere in the hyper-connected human brain, because anticipation and brain time inversions make *before* and *after* indicate little about human

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neuropsychological causality, and *inhibitory on or off* and *activating on or off* are *a priori* functionally equivalent with respect to the logic gates of information encoding, transport or storage, the modern study of brain mechanisms in emotion, cognition and behavior remains almost as mysterious as ever.

* * *

The only human mind-brain observations that are doubted consistently, and treated as unpublishable by the editors of the journals of science, are those that result from direct human experience using subjective reports from within. They are called unscientific. Often ignored are logically consistent mathematical and computational contexts, which, as abstract and general tools of thinking and imagining, have the capacity to frame, rigorously define and describe thinking about both the subjective and objective aspects of brain-generated phenomena. These mathematically configured metaphors can lead to consistencies in description, *this is behaving like that*, in what are called *equivalence relations* expressed both as intuitive imagery; for a concrete example, a one holed bagel and one handled tea cup are *topologically equivalent* because, sculpting in clay, they can be smoothly transformed into each other. We have seen that *invariant measures* in computable statistical flows can come out of a mess of data. Professor Paul Rapp of the University of Pennsylvania has been able to mathematically encode the verbal content of the patient's free associations and the therapist's responses, using tape recordings of hours of psychoanalytical treatment. Examples of quantifiable qualities found useful in this regard involve a variety of characteristic statistical patterns in what are called *entropies* and *information* as well as various measures of what with a wide range of definitions is called *complexity.* These quantifiable properties, *measures*, can help in the struggle with the intrinsic tension of Absolute Reality between the "eternal emptiness of form and the eternal form of emptiness." We resort to measures of *entropy*, *information* and *complexity* when confronted with our ignorance, "emptiness," great or little, with respect to either cause or result, about what exactly is going on. *Entropy* in its forms relevant to information quantifies our

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ignorance, the emptiness and its mystery. Computations of the entropy of systems in motion convert questions and answers concerning the detailed workings of the leg's neuromuscular machinery to global statistical descriptions of more abstract thematic motifs, *forms*, expressed in the dance. Patterns of behavior of these properties can suggest intuitive ideas and imagery about global mechanisms, *approach/avoid*, *smooth/discrete*, *wild/tame*, as well as correlated and objective physical observables.

To learn more about this abstract, topology tinged (none numeric) style of model building, we can go to school on a long studied physical example. It connects a simple and well understood *real world observable* with *abstract statistical patterns* resulting from motions using the *one-to-one correspondence* (the *equivalence relation* called *isomorphism*) between their *entropies*. As we have discussed, the Stanford mathematician and Field's Medal Winner, Donald Ornstein, proved that in statistical studies of even *point-to-point unpredictable*, *chaotic systems*, *entropy is the only isomorphism*. The *hardware* of this physical example is what the statistical physicists call a dilute gas of some fixed number, *n*, of uniform hard spheres, *moving scatterers*, that, absent of *dissipative friction*, wander continuously around, changing their directions when bumping into each other. In a two dimensional bounded arena of randomly rolling balls, this game has been called *Sinai's billiards*. It was named for previously mentioned Ya Sinai, an eminent Russian mathematician He is now at Princeton and was previously a student of Andrei Nikolaevic Kolmogorov, the Russian guru of many of the Twentieth Century's world-class Russian mathematicians. Kolmogorov axiomatized the field of probability and, more relevantly, initiated the theory of *statistical descriptions*, the *ergodic theory*, of *nonlinear dynamical systems*. In the language of *statistical physics*, we will see that the same system produced by high number of elements executing Newton's deterministic laws can be generated by a so-called random system such as that resulting from flipping a suitably biased coin. Our example can also serve as a metaphor, used extensively in the mathematical biology of the late Professor Art Winfree, for the *temporal features of life on a topological circle*: the natural irregularities of the recurrent beat of the heart, the in and out breathing of lungs, the

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up and down voltage of brain waves, the pendulum swings of our blood hormone levels, the cyclic procession of our days, months and years and at large scale, our body's journey from dust to dust.

The angular deviation theta, θ from the initial reference direction of a single moving sphere, gets rotated to a new angle theta, $\theta \rightarrow \theta'$ by a collision with another sphere. It has been shown that the new angle θ' is the previous angle, times twice the average distance traveled between collisions called *the mean free path*, here symbolized by delta, δ, divided by the diameter, *D*, of the sphere. Algebraically, $\theta' = \frac{2\delta}{D}\theta$ the new angle is equal to twice the *mean free path* divided by the diameter of the spheres times the original directional angle of the sphere's motion. If we symbolize the time between collisions with tau, τ, after an elapsed time of experimental observation, *t*, we can say that the deviations from the initial direction of the sphere changes like $(\frac{2\delta}{D})^{t/\tau}$. The exponent, t/τ, represents the time of the experimental observation divided by the average time between collisions of the spheres, i.e. the time we've been watching, *t*, is expressed as units of inter-collision interval, τ. Of course, the circular deviation in the angle from the initial direction rotates repeatedly around a circle as the number of collisions increase. If a point on a circle marks the angular change resulting from each collision and the system runs long enough, it has been shown that the circle will eventually be completely covered by points.

An *estimate of the entropy*, *S*, being generated by each sphere labeled with some index *i*, S_i, is positive because the recurrent motion is deviating continuously from the initial direction. It can be computed for each sphere as the *logarithm of the intercollision time-averaged deviation from the initial direction*, $S_i = \frac{1}{\tau}\log(\frac{2\delta}{D})$ and the *entropy* of the whole n hard sphere system is the sum of the *n* entropies, which can be expressed as $n \times S_i$. If we keep books by registering the points when each sphere's makes a stop on the top half of the sphere's circle as 1 and the bottom half as 0 (and we must arbitrarily decide between 0 and 1 if it falls exactly on the

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division between top and bottom and do so in a consistent way), then we can keep score with a random looking binary series such as 11001001010.... that describes the sequence of rotations. The advantage that accrues by doing so is that this *coin flip counting* eliminates details in favor of a *computable over all measure* and supports several forms of *entropy calculations* for its use in deciding if *this system is behaving like that system*, an *equivalence relation*. One can imagine a series of coin flips with 1 being heads and 0 being tails such that the statistics of a characteristic series is determined by the *fairness* of the coin. As noted above, Donald Ornstein's famous theorem says that the entropy of these kinds of hardware and software systems is the only general basis for finding correspondence between characterizations of two such *irregularly behaving systems*. The important idea here is that a series of 1's and 0's may not be identical but the two systems can be *isomorphically equivalent with respect to their entropy.*

Notice again that the physical process of hard spheres bouncing off each other on a flat surface has been captured by an abstract representation in *binary numbers* that, like a series of coin flips, can be quantified as entropies (which would be maximal for an ideal, fair coin). After describing the process of real number representation by the binary code, we will show *how entropies can be computed for these binary series*. We remind ourselves that we are struggling to obtain some kind of knowing in a representative system manifesting the *tension and mystery between emptiness and form.*

We can translate all finite real numbers into this language, making them accessible to standard entropy computations. The following discussion of the process of *transforming numbers into binary series* is in the spirit of the famous number theory theorem that every *natural number* (the *positive integers* such as 1, 2, 3, 4...) can be expressed as the sum of at most four squared numbers. Encoding any number by a series of 0's or 1's in what is called a *binary transformation*, begins with its separation, called *partition*, into a sum of powers of 2, for example, 100 = 64 (2^6) + 32 (2^5) + 4 (2^2). A short hand description of this sum begins with a form indicating the presence or absence of each successive power by a 1 or 0 coming before the relevant power of two; i.e. $100 = 1 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 1 \times$

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$2^2 + 0 \times 2^1 + 0 \times 2^0$ (in which the last term, arbitrarily, is $2^0 = 1$, since anything to the power 0 = 1). This can be written even more simply as a series of 0's or 1's, their presence indicating whether the power represented by each place in the left to right descending sequence of powers of two participates in the sum of the partition. It is in this way that in binary numbers, 100 = 110010. As another example, if we similarly partition the decimal number 729 = 512 (2^9) + 128 (2^7) + 64 (2^6) + 16 (2^4) + 8 (2^3) + 1(2^0), we find that its binary transformation results in 729 = 1011011001, the 0's representing the descending powers of two that are absent in the powers of two partition. One can compute the binary representations of lower valued numbers immediately; for example, $4 = 1 \times 2^2 + 0 \times 2^1 + 0 \times 2^0$ so that there is a 1 in the multiply-the-power-of- two column and 0 the power 1 and power 0 columns so in binary representation, 4 = 100. Similarly, $6 = 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$ making the binary transformation of 6 = 110.

It was the co-inventor (with Isaac Newton) of the calculus, Gottfried Wilhelm Leibniz, in about 1665, who fully developed the *binary representation of all decimal numbers.* In a state of wonderment about the simplicity, power and completeness of this 1 and 0 encoding, he is said to have the beliefs that 0 symbolized the emptiness of the universe's beginnings, 1 represented the complete fullness of God and that this transformation served as metaphoric evidence consistent with God's creation of the universe out of nothing.

The simplicity of binary expressions as in the dynamics of hard spheres or rotations on the circle as well as the transformations such as 729 = 1011011001 make them propitious for exemplifying the methods for computing the *entropies of the growth rate of the possible, called the topological entropy*, H_T, and the *probable, the metric entropy,* H_M, which was introduced in a previous chapter called "Sensual In-Between Entropies." The following exemplify the computations of measures of *topological and metric entropies*, H_T and H_M, another computable idea called *algorithmic complexity*, *AC* and finally, the well known (to statisticians) *standard run score, src*. Their descriptions *have* as their purpose a demonstration for the reader that these apparently abstract, perhaps nebulous sounding, words can be transformed into well-defined, concrete, quantitative and computable form of reality.

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If acceptance of this idea does not constitute a problem for the reader (and you do not find it fun to follow along with a computer math program and/or a pencil), then the following several paragraphs can be quickly scanned or skipped entirely.

The computations of H_T and H_M begins with keeping track of how many $0 \rightarrow 1$ and $1 \rightarrow 0$ transitions are found going from left to right in the binary series. For example, in the binary expression of 729, 1011011001, one starts counting with a $1 \rightarrow 0$ transition followed by a $0 \rightarrow 1$ transition and then a $1 \rightarrow 1$ transition and so on. A useful way to record the count is via entries into a 2×2 matrix for score keeping in which the horizontal rows are labeled 0 on top and 1 below and the vertical columns are labeled 0 on the left and 1 on the right. The number of each kind of transitions (from the vertical label to the horizontal label) are counted and summed in the appropriate box of the two box by two box matrix; for examples: for a $0 \rightarrow 0$ transition, a tally mark is entered in the upper left corner of the matrix; for a $0 \rightarrow 1$ transition, a tally mark is entered in the upper right corner; a $1 \rightarrow 0$ tally goes in the left lower corner and a $1 \rightarrow 1$ is tallied in the right lower corner. The resulting transition incidence counting matrix, M_t for the 729 binary transformation series looks like $M_t = \begin{matrix} 1 & 3 \\ 3 & 2 \end{matrix}$ indicating one $0 \rightarrow 0$, three $0 \rightarrow 1$, three $1 \rightarrow 0$, and two $1 \rightarrow 1$ transitions have been tallied. Although this series alone is too short for computing reliable statistical measures, if we assume that the pattern of transitions observed in this short series is stationary, that is its transition behavior will remain the same if the binary series continued on to be infinite in length, the *assumption being that the dynamics of now will be the same as always*, 729 will stay 729, then we can use two forms of this transition matrix in the computation of the *topological entropy* reflecting the *growth rate of the possible*, H_T, and the *metric entropy* from the *statistical weights of allowed choices among them*, *the probable*, H_M.

To obtain the entropy representing the *growth rate over time of the new possibles*, the computation of H_T, the *topological* entropy, involves first transforming M_t into an *transition incidence matrix*, $M_{t,i}$ a 0 or 1 matrix indicating whether each box has been entered at all (or not). Since in the binary representation of 729, all

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four boxes of M_t are occupied, the $M_{t,i}$ = $\begin{matrix} 1 & 1 \\ 1 & 1 \end{matrix}$ indicates that all four kinds of transitions are possible. Since we remain in the context of a 0,1, two state system, the growth rate of the possible equals the logarithm, base two, of the sum of the entries in the boxes of the left-top-row to right-bottom-row diagonal called the *trace* and $H_T = log_2 (1 + 1) = log_2(2) = 1$. Consistent with intuition, since every transition is possible, the topological entropy of M_t as indicated in its $M_{t,i}$ is maximal (= 1). Another expression equal to the *sum of the trace* (the sum of the upper left to lower right diagonal) in a square matrix, is its leading *eigenvalue*, most often symbolized with a lambda, λ_1. *The logarithm of the leading eigenvalue of the transition incidence matrix is equal to its topological entropy*. Symbolically, $H_T (M_{t,i}) = log_2 (\lambda_1) = log_2 (2) = 1$. Standard elementary linear algebra texts describe how to compute eigenvalues, these relations and related operations as well as their foundational theorems.

Before computing the entropy of the distribution of probabilities among the possibles as the *metric entropy*, H_M, let us notice again that the occupancies in the four entry boxes of the transition matrix M_t are not uniform, M_t = $\begin{matrix} 1 & 3 \\ 3 & 2 \end{matrix}$. This leads naturally to the intuition that for this series of binary transitions, H_M, in contrast with H_T, will not be maximal, i.e. not equal to 1 and the nonuniformity of H_T and H_M is a computational expression of what we mean by a state of *in-between entropy.* These entropies are identical and their difference = 0 for transitions reflecting maximal entropy, as might be realized in a very long series of fair coin flips in which the entropies = 1. Entropy will be minimal when flipping a two headed coin, here the entropies = 0. More compactly, the *non-uniform probabilistic, metric entropy, differing from the maximal topological entropy* indicates that the system is in a dynamical state of *in-between entropy*, written as $H_T - H_M \neq 0$.

In the computation of the metric entropy, H_M, the M_t is transformed into a transition probability matrix, $M_{t,p}$, called a *Markov matrix* named for one of the two great Russian mathematicians, both students of Pafnuti Lvovich Chebyshev, the Markov brothers. The entries of each row in the M_t are transformed into transition

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probabilities, so that the sum of the decimal fraction parts of all the boxes in each horizontal row add up to 100%, or as a real number, 1.00. Recall that in the example we've been using, the binary expansion of the natural number 729, the transition incidence matrix is $M_t = \begin{matrix} 1 & 3 \\ 3 & 2 \end{matrix}$ and its Markov matrix is top row, 1/4, 3/4 and bottom row 3/5 , 2/5, i.e. $M_{t,p} = \begin{matrix} 0.25 & 0.75 \\ 0.60 & 0.40 \end{matrix}$. *Matrix multiplication* of $M_{t,p}$ by itself repeatedly is equivalent to tracking the temporal evolution of the transition matrix's probabilities until the resulting matrices move toward, *converge onto,* a steady state; each self matrix multiplication step represents what results from the passage of one unit of time. The convergence to equilibrium values is continuous and gradual. When the steady state is reached, *both rows become identical*. For this example, $M_{t,p} \times M_{t,p}$ or $M_{t,p}^{\ 2} = \begin{matrix} 0.5125 & 0.4875 \\ 0.3900 & 0.6100 \end{matrix}$; $M_{t,p}^{\ 4} = \begin{matrix} 0.4527 & 0.5472 \\ 0.4377 & 0.5622 \end{matrix}$; $M_{t,p}^{\ 8} = \begin{matrix} 0.4445 & 0.5554 \\ 0.4443 & 0.5556 \end{matrix}$; $M_{t,p}^{\ 16} = \begin{matrix} 0.4444 & 0.5555 \\ 0.4444 & 0.5555 \end{matrix}$ which for the first four decimal places remain the same for additional times of self multiplication. Note the convergence of the top and bottom rows to the same asymptotic values. Books discussing the multiplicative and other behavior of these *nonnegative matrices* are numerous and frequently appear in matrix algebra texts under the rubric of the *Frobenius-Perron theorems*.

Using the entropy formalism of Claude Shannon as developed previously, H_M is computed as the sum across either of the identical rows of each probability times its logarithm, $\rho_1 \times log(\rho_1 \rho_2 \times log(\rho_2))$ remembering from above that we are working in base 2 logarithms and to change the minus sign (resulting from taking the logarithms of decimal fractions) to plus: $H_M\ (M_{t,p})$ = .4444 $\times$ *log*(.4444) + .5555 $\times$ *log*(.5555) = .9911 The *nonuniformity* of the box occupancy probabilities is reflected in *the difference between the topological (maximal estimate) and metric (minimal estimate) entropies* and is therefore quantifiable and computable: $H_T - H_M \neq 0$ = 1.00 - 0.9911 = 0. 0089. If the maximal and minimal estimates of the entropy were equal and all the probabilities boxes in each row asymptotically contained the same

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probabilities as in $M_t = \begin{matrix} 0.5 & 0.5 \\ 0.5 & 0.5 \end{matrix}$, it would retain these values across an infinite number of self multiplications such that $H_M = .5 \times log(.5) + .5 \times log(.5) = 1$ and $H_T - H_M = 1.00 - 1.00 = 0.$ 0.

Complexity is a more general and variously defined descriptive expression than that of the topological and metric entropies and as such brings with it many kinds of definitions and computational approaches. One choice that's intuitively appealing assumes that the relative complexity of an expression representing, say an outcome of an observation or experiment, is reflected in the *minimum length of the most compressed program* (*algorithm*) from which, given a suitable *dictionary of symbolic equivalencies*, one can reconstitute the original expression. Increases in what some have called *algorithmic complexity, AC,* are reflected in the growth of this minimally descriptive symbol series length. Karen Selz's approach to compression and *AC*, similar to one proposed by Paul Rapp, involves the identification and symbolic representation of repeated blocks of symbols called *words.* For example, given an arbitrary, exemplifying binary series: 011011101010001010101001001010011, we first find the longest repeated word [1010100] and represent it with the symbol, *a*, yielding a shortening in the original series, 011011*a*010*a*1010011. The next longest repeated word is [011] is replaced with *b*, yielding a further compression, *bba*010*a*1010b. The next remaining binary word is of length equal to the previous one, [010], which, when replaced by *c* results in the series *bbaca*1*cb*. This can be further compressed to the final representation with four symbols and for the sequentially repeated *b*, one exponent of degree two, $b^2aca1cb$. From this representation and a dictionary of letter equivalent words, the original binary expression can be recovered. For a quantitative index of the *algorithmic complexity, AC,* of the compression, Selz computes the sum of the number of distinct symbols plus the sum of the natural logarithms of the exponents: 4 + log (2) = 4.6931. The binary representation of 729, 1011011001, discussed above, is compressed by making two [101]'s = *a* and two 0's = *b* resulting in a^21b^21. Having three distinct symbols, *a*,*b*, and 1, and two exponents of two, its algorithmic complexity is equal to, $AC = 3 + 2 \times \log(2) = 4.38$.

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In addition to H_T, H_M and AC, if computable in a meaningful way, the *deviation of the binary series under study from the idealized random behavior of a fair coin* could serve as another index of complexity. Common descriptions of the amount of randomness in a series are indices of *run length* If a *run length* is defined by number of elements in a series of the same symbol before it stops, counting the *number of run boundaries* by reading along the binary series and counting the *number of switches* from 0 $\rightarrow$1 or 1 $\rightarrow$ 0, then the binary expression of 729, 1011011001, has six runs. The great analytic probabilist, William Feller, among many others, including the distinguished 18th Century Swiss family of mathematicians, the Bernoulli's, proved that computing a *standard run score*, *srs*, involves three terms, the theoretical expectation, E, of the number of runs, r, that is $E(r)$, the number of runs actually observed, $Obs(r)$ and the variance of the expectation of the number of runs, $Var(\ E(r)$. If the *srs is less than zero*, *then the binary series is more random than that resulting from the flipping of a fair coin*. Interestingly, when a normal group of subjects are instructed to simulate what they think of as a random coin flip determined series of 0's and 1's, their *srs* tends to be lower than zero, over-estimating the degree of irregularity that randomness represents. Long runs occur by chance far more often than intuition would dictate. If *srs is more than zero*, than the binary, coin-flip series is *more ordered than random*. If *srs* equal to zero, the binary series is not discriminable from fair coin flipping randomness.

The expected number of runs, $E(r)$, can be estimated by a fraction formed by twice the product of the number of heads times tails divided by the sum of the heads and tails to which is added one. That is, $E(r) = \frac{2\times 6\times 4}{6+4}+1=5.8$. The average variation around this expectation called the *variance*, *Var*, of the expectation, $Var(E(r))$, is estimated by a fraction formed by (take a breath) twice the product of the number of heads times tails $\times$ twice the product of the number of heads times tails minus the number of heads and minus the number of tails, all over the product of the sum of the heads and tails squared, times the sum of the number of heads

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and tails minus one. That is, *Var*(*E*(*r*)) = $\frac{(2\times6\times4)(2\times6\times4-6-4)}{(6+4)^2\times(6+4-1)}=2.03$. From these three terms, we compute *srs* = $\frac{E(r)-Obs(r)}{\sqrt{Var(E(r)}}=\frac{5.8-6,0}{\sqrt{2.03}}=-0.140$. We conclude that the *standard run score* of the binary series is less than zero and therefore more random than the expected random behavior of a fair coin.

Recall from the last chapter that Karen Selz, Martin Paulus and others have shown that various personality types and psychiatric diagnoses are associated with characteristic deviations of *srs* from zero. When the winners of the 2002 Annual World Rock, Paper Scissors Championships held in Montreal Canada were interviewed, they said that sensing their opponent's characteristic style of deviations from randomness in what we would call the continuum from maximal to minimal entropy determined their successes. We characteristically use all of these measures to estimate quantitate the deviation from randomness *standard run score, srs*, *algorithmic complexity, AC,* as well as H_T and H_M,, the *topological* and *metric entropies*.

* * *

The encounter with mystical Absolute Reality, though sought by arduous contemplative and other practice, emerges spontaneously, most often during times of apparent mental emptiness, detachment, a state in which rationally instructive thought and the choral background of brain voiced, emotion-ladened, commentary have disappeared into the entropic soup of formless silence. It is this indescribable, ineffable, stillness that we think serves as the psychophysiological anlage of mystical experience. The mathematical systems yielding quantitative metaphors, descriptive ideas about dynamical entropic statistical emptiness and form inspire the use of mathematical structures in place of localized lumps in brain meat as personalized icons of doing.

Our wedding of well-defined mathematical objects to metaphoric elements of more general nonverbal intuition has a long tradition. Rene Thom's 1990 book,

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Semiophysics, discusses mathematical mechanisms and their representations in mind and the real world, analogizing mathematical objects and the intuitions they generate to *mechanical tools.* Similar ideas are found among the *four liberal arts of the ancients: Number, Geometry, Music and Cosmology.* The epistemologies of all four require, then and now, the intuitive use of mathematical objects, conscious or unconscious. Examples can be found in conceptual issues of Geometry and Number with implications for relationships between man's physical and psychological worlds. One set of articulations were attributed to the *shapes of Platonic solids* found among the Neolithic stone circles in Aberdeenshire, Scotland, 2000 years before Plato. Each symbolized particular physical and psychological themes. All manifested equal edges and every face of each solid was the same perfect polygon. The solid with four equilateral triangles manifesting four vertices and faces, the *tetrahedron*, represented the physical element, *Fire*, and the personal psychological climate of a choleric, fiery nature. A Platonic solid composed of eight equilateral triangular faces, two tetrahedrons annealed, the *octahedron,* signified *Air* in physical composition and optimistic hopefulness in psychological disposition. Six square faces together making a *cube*, evoked the elemental physical component, *Earth*, and its human expression as a phlegmatic, apathetic personal style. Twenty faces, all equilateral triangles, constitute an *icosahedron* indicating *Water* and a dominant feeling state of melancholic sadness. Like onomatopoeic words and pictorial script, the three dimensional geometry of *these Platonic solids feel like what they came to symbolize.*

The personality styles symbolized and evoked by the Platonic solids continue to be used to this day. For example, they compose the basic elements of the constitutional categories of remedy in homeopathic medicine as introduced over 200 years ago by Dr. Samuel Hahnemann in his classical *Organon of the Medical Art.* The assignment of clinical remedy in homeopathic treatment combines consideration of the presenting physical symptoms and signs, the *what*, with intuitive discernment of the patient's constitutional type, the *who.* To the homeopathic physician, *tetrahedral fire* is suggested by the traits of personal magnetism, courage and inspiration as well as egotism, strong desire and rage.

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Octahedral Air people intellectualize objectively in confident and insensitive aloofness. Those symbolized by *cubic Earth* are realistic and practical, a what-you-see-is-what-there-is belief along with rigid, materialistic ways. *Icosahedral Water* types experience emotions strongly and are sensitive, intuitive, nurturing and can be overly sensitive and dependent.

What intuitions and observations relevant to self, subjective and objective, emanate from the stylistic properties of feelings as derived from a time series of observations of their associated actions suggested by their statistical measures, H_T, H_M, *AC* and *srs*? The yield is rich and unexpected. We find an enjoining of values of these measures, characteristic and invariant for each person, with the brain and behavioral actions of entheogenic agents and Zen meditation in contrast with worldlier focused attitude adjusting experiences and drugs. The range of their potential values helps rationalize a person's inclinations along the continuum of *attachment* and *detachment.* This quantifiable dimension augers positively and negatively with respect to the requirements for mystical experience as poetically described by the ambivalent warrior prince, Ardjuna, in conversations with Lord Krishna in the *Bhagavad-Gita*, the most famous and influential component of the *Mahabharata* of Hindu scripture, A similar theme relevant to the occupancy of a propitious range of values for the measures, H_T, H_M, *AC* and *srs,* is found in what is often called the *Second Nobel Truth* as explained by the Buddha, Siddhartha Gautama, in lectures recorded in a deer park near Benares. We begin with the results of some drug experiments conducted by behavioral neurophysiologists and end with suggestions about the intuitive relevance of the conceptual content of these measures to the *universals of mystical experience* and perhaps to elements of *spiritual transformation.*

As described previously, the brain and behavioral process of *habituation* is characterized by a decrease in the strength of an observable response to the repetition of an evocative stimulus. Imagine the decrease in our startle responding when a once unexpected loud noise continues to occur. Sir Charles Sherrington, the early Twentieth Century British pioneer in neurophysiology showed that animals and humans gradually stopped the withdrawal of their limbs with stimulation of its

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skin when it was repeated several times. Columbia University's Nobelist in the brain sciences, Eric Kandel studied the neural mechanisms of *habituation* as a *primitive, accessible and fundamental example of learning,* the association of a nonresponse to a usually evocative stimulus, in *Aplysia californica.* The *sea snails* learned not to respond to a local irritation with a *gill-withdrawal response* when exposed to it many times. They learned to stop paying attention to the perturbation. The background noise appears to disappear after a little time in the Mall. Though his exploration of its synaptic mechanisms involved the neural circuit of the gill-withdrawal reflex in the marine snail, its generality and human relevance is well established. Hundreds of papers can be found reporting the results of studies of habituation in normal humans under all kinds of circumstances as well as in psychopathological conditions. That it samples something both fundamental and persistent is suggested by studies in children by one of Kandel's students, Michael Lewis. He found that the *rate of habituation of a startle response* to a bright light in one-year-old human infants predicted success in many kinds of learning and other cognitive functions when the children were tested again at the age of four. Pavlov's experiments studied habituation of the classically conditioned salivary response to meat powder-coupled bell sounds in dogs in which the bell was followed by nothing, not only led to inhibition of the salivary response with unreinforced trial repetition but generalization of the inhibitory state such that dogs were observed to freeze in motionless catatonic states for hours. In the language of our statistical measures, the fixation of the dog's behavior would manifest minimal entropy in the form of $H_T = H_M = 0$ and the lowest complexity values for *AC* and *srs.* Entheogenic agents like *LSD* or *mescaline* inhibit the process of habituation and fixation, maximizing the entropy of behavioral measures, H_T, $H_M \rightarrow 1$ and high complexity values for *AC* and *srs.*

Mark Geyer and David Braff, Professors at the University of California in La Jolla and Michael Davis, a Professor at Yale's School of Medicine, found that entheogenic agents, such as mescaline and LSD, as well as naturally occurring indoleamines, such as DMT, which occurs naturally in human brain, *prevented habituation of startle responding* in mammals. Each sound repetition was treated as

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though it were new. *The baby is Buddha* is an Eastern philosophical aphorism that captures the fresh spiritual state of each moment's openness and readiness, the *in-between entropies* for new information surprise. Geyer and Martin Paulus found that entheogenic agents such as *Ecstasy* also increased the *complexity* of the patterns of *spontaneous motor movement* made by rats exploring a bounded space. Recall that they partitioned the floor to document the exploratory motion in the context of a sequence of location transitions, readying the data for the computation of some of the measures previously described. Following the administration of entheogenic agents, the partitioning of the space that the animals were exploring, into a lattice of discrete boxes and the encoding of each square with a symbol, the computable entropic and complexity measures such as H_T, H_M, *AC* and *srs* were increased. In contrast, the administration of amphetamine-like stimulants led to a different kind of behavioral activation than that induced by entheogenic agents. The measures of H_T, H_M, *AC* and *srs* reflected decreases in entropy and complexity. As University of California's David Segal and others documented in the 1960's, high doses of amphetamine led to animals into in a minimal entropic state, they were frozen in stereotyped rocking, nodding and circling motions. High dose amphetamine-treated humans develop rigid fixation of ideas, low H_T, H_M, *AC* and *srs*, in man this is seen as inescapable obsession and paranoid delusion. There is considerable medical evidence that Hitler took large doses of amphetamine (Benzedrine) daily for the last 20 years of his life.

The entheogenic drug-induced phenomena of naïve openness and absence of fixation, states of high entropy and complexity, behavior generating higher than control measures tending toward maximal values of H_T, H_M, *AC* and *srs* , are subjectively reflected in the results of personal experiments of University of Chicago's Heinrich Kluver as described in his *Mescal and Mechanisms of Hallucinations* (1966). Observing himself after the self administration of a crude preparation of *peyote cactus,* he said that it led to *glad feelings of unfamiliarity* and a *marked reduction in his tendency for boredom* (*habituation*), a detachment from old ways of thinking and a new openness to a rush of *seen again for the first time* experiences. Everything in his personal world, no matter how mundane, became a

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source of new interest and fascination. New thoughts replaced old ideas in a continuing process of new formulation. All of these things feel like they emerge spontaneously, *making ideas about being born again and personal renewal concrete.* We remember that Timothy Leary and his wife in their privately circulated pamphlet, *Neurologic*, described their entheogenic drug-induced escape from the habitual order as supported by the learned and established "...mental-manipulative and socio-sexual brain circuits...," an escape to a fresh new planet of possibilities. Louis Lewin, the early Twentieth Century German pioneering ethnopharmacologist described his subjective responses to *peyote* as a flood of lively, numerous, random fantastic creations of perception and thought, all demanding his fresh attention.

To complement these subjective reports, experimental tasks involving habituation, such as the disappearance of a brain wave sign of arousal to sound or light stimulation, called *alpha blocking,* the eyes-closed resting pattern of 8-14 cycles per second, *hz,* waves perturbed into the arousal pattern of >20 *hz*, did not habituate when the subjects were pretreated with *entheogenic drugs*. This finding was also true for the results of years of meditative practice. In his 1974 *Psychophysiology of Zen*, Hirai reported that Soto Zen monks, after many years of practice in mindful, one pointed, *be here now meditation*, unlike normal controls, continued to show *alpha blocking surprise*, *brain wave arousal patterns,* throughout the course of repeated stimulation with auditory clicks.

James Austin in his monumental book, *Zen and the Brain* (2000) summarizes other studies of habituation in TM practitioners and other mediators in which eyes open versus eyes closed, the set and setting and variations in other experimental variables blurred these results to some degree. He develops the case that years of meditation-induced brain states of emptiness, we would say of maximal entropy and minimal form, set the stage for the ecstatically insightful flood accompanying the sudden insight into a *Zen koan's* solution or the transcendent startle induced by a *roshi's shout.* A meditative struggle concerns how one can think about not thinking. That is, thinking of nothing. This is generally thought to be the most important part of Zen meditation, called *zazen*. Achieving high values for brain and behavioral H_T, H_M, *AC* and *srs* supply the formless infrastructure for ecstatic transformation.

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In healthy people, an awareness of self is not lost during *this time of invasion by and fusion with what feels like an independent agency.* At full force, the mystical experience is transfixing, tending to paralyze movement and speech, and at the same time bringing with it the capacity for clear sensory and sensory-integrative lucidity. This new seeing *brings previously unnoticed things to attention and makes old things new*. Perhaps most striking is the passive (unsought) experience of the *unification of erstwhile disparate*, apparently unrelated thoughts and feelings. The yield can be the sudden emergence of deep relationships between apparently very different constructs, beliefs and formalisms leading to unanticipated and unsought integrative connections. In mathematics, this experience can lead to entirely new kinds of theorems and proofs; in the physical and biological sciences, a previously unseen organization of the data generating new global relationships and potential scientific laws. In our spiritual life, the ineffable richness of the direct experience of God.

Mysticism-negative interpretations of these experiences have always been attendant. To the extent that the mystic's inward turn is seen as a detachment and implicit derogation of the *external, consensually real world*, it is often seen as alienating from established institutions of religion and government. Psychoanalytic practitioners may label it a *regression to primary narcissism*. Most churches tend to discourage its practice as counter to the dominant social hierarchy and its governance. Governments pass laws against its practice and manifestations, a current example being modern Chinese governmental reactions to the *Tibetan Buddhism of the Dalai Lama* and the *yogic practices of the Falon Gong*. Agencies of established society such as the institutions of licensed medical practice make the dominance of the inner world of mysticism subject to diagnoses ranging from the *narcissistic character disorders* to interpretations of the reported extraordinary experiences as manifestations of *schizophrenia*, *manic-depressive disorder* or *temporal lobe epilepsy*. Rejection and fear of the transcendent states lead to uninformed and politicized anti-narcotic laws, grouping heroine and cocaine with the *entheogenic* (recall: *engendering connection with the sacred within*) agents such as the *Huichol Indian's peyote* and the *Amazonian Indian's yage,* obstruct and socially

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taint the personal use of plants and practices that facilitate access to the *mystic way*. Rational, socially responsible and otherwise kind and tolerant Presbyterians, Unitarians and Reformed Jews can be suspicious and rejecting of what appears to them as the politically tinged *mass hysteria of praying in tongues* and other rituals of Charismatic Christian rebirth and renewal or the ecstatic states of Orthodox Jewish chant-dancing.

Modern brain and behavioral scientists, remaining under the philosophical spell of *logical positivism* and its requirement for operational definitions and (external) *experimental disconfirmability*, operate from the position of strong doubt when mystical experience is addressed. What is striking and strange about how science plays the game of mysticism research is exemplified by the publishable increment in credibility concerning a meditation-induced change in state of consciousness when Boston University's William Benson reported the accompanying *relaxation response*, a sudden decrease in heart rate---much like the *dive reflex of a seal* or what the heart rate does when you duck your head suddenly forward into a sink full of water. Decades are spent getting professorial tenure for research yielding things we have already experienced and know directly and for ourselves. Recall that the existence of visual imagery in the human, doubted by an experimental psychology of the time in which William James self-exploratory observations were viewed as revolutionary, was made more credible by evidence for the existence of a *subjective spatial metric*: verbally reporting subjects, when timed, took longer in their minds to go from one room to another one that was down the hall then going to the room that was immediately next door.

We use brain chemical, pharmacological, neurophysiological and neuroanatomical localization and computation of characteristic statistical patterns in time dependent brain and behavioral observations to the same end.

Further Readings for SOME ENTHEOGENIC ENTROPIES

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CHAPTER 6:

PENTECOSTAL PHASE TRANSITIONS

By their late teens, my two offspring, sons of an Alcohol Anonymous, born again, originally Christian Science mother and a spiritually struggling and mostly secular Jewish psychiatrist father, had been unfulfilled in their hungry search for the experience of a personally meaningful God. After years of perhaps too academic conversations with their parents, visits to a variety of houses of worship, talks with University of California religion professors and evenings with a Ph.D. psychologist-rabbi and friends at the neighborhood synagogue, they turned somewhere else. Some of their high school friends who were Evangelical Christians took them to their Assembly of God, Pentecostal and other Christian, direct experience of God, churches. They came to love what they sometimes called their Wednesday night and Sunday morning "rock and roll," services.

Struggling with the post-Vietnam cynical mistrust of authority and the marijuana apathetic nihilism of the 60's and 70's, and clearly not enticed by what they regarded as their father's vacuous mélange of New Age Eastern Religions and secular brain science, they spoke about their sudden and life-changing experiences. They studied, memorized and quoted the Scriptures as part of their commitment to their *word churches*. As erstwhile cynical teenagers, now positive and brimming with faith, I secretly called it denial, they described what was happening to them as New

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Birth. They told me that, paraphrasing Paul in Romans, they had been saved and were living New Life, not earned by good works as in Hebraic Law, but by faith through God's Grace. Jesus had "paid their bills" through His sacrifice at Gethsemane. They both tried to explain inexplicable feelings of new energy, the unseen hand of spiritual guidance and peace. One told me that the wind of the Holy Ghost had taken him to the front of the pulpit, tearfully, thankfully, on his knees, to accept Jesus as his personal Savior. They described how they had opened their lives to the spiritual strength of *living in Jesus*.

Many things about them changed: their tastes in food, from hamburgers to vegetables and fruit; from the jazz of John Coltrane and McCoy Tyner and the cynicism of Frank Zappa's "...only fourteen and knows how to nasty...," to playing strum guitar and singing the hymns of Wednesday night healing services; from t-shirts hanging out of raggedy, Southern California, boutique store purchased, stressed jeans, to polished dark shoes, starched white shirts and gray or tan khaki slacks, sometimes with ties. They became cool, respectful, rational and more distant with me. They repeated often the scriptural story about young Jesus, accidentally separated from his parents on a visit to Jerusalem. When by standers asked Him about where His parents were, He answered, "I have no mother and father." They told me that they, like God's son Jesus, were filled to completeness with the Father and the Holy Ghost.

On one hand, their experiences sounded like those of the *activated mind* state of Abraham Abulafia, a suddenly emergent *Nevesh* and my father's metaphysical talks about personal transformation. My personal secular-computational brain God spoke to me of the mechanisms of sudden personality change, a *phase transition* in *complex systems*, in the context of the *nonlinear dynamics of brain and behavior*. On the other hand, their global changes in mind felt both alien and threatening. When I came to learn their churches' full list of expectations, rules, requirements and sociopolitical policies, I found that I could not identify with this system of spiritual knowing at all. It felt rigid, righteous, unforgiving, even angry, and it frightened me. I never anticipated that my culturally enriched, intellectually sophisticated sons would be quoting Pat Robertson and Jerry Falwell.

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The Freudian psychoanalyst of my younger days tried to write off these (to me) cataclysmic changes as manifestations of male sons' unconscious oedipal strivings to father kill and thus become. After some mulling, my theory did not wash.

They spent time accompanying themselves on guitars, singing hymns and shouted Corinthian Paulisms to small curious crowds gathered in beach parking lots, city parks and inner city street corners of Southern California. They passed out pamphlets containing New Testament tracts and formulaic aphorisms promising the post-repentance blessings of Jesus. The eldest, articulate, bright and prematurely worldly, had been an ardent memorizer and appreciator of Shakespeare, especially the mystical *Tempest*, the music of Aaron Copeland and Igor Stravinsky, the improvisations of Charlie Parker and Cannon Ball Adderley and the provocative literature of the time including Jack Kerouc's *On the Road* and Hunter Thompson's *Fear and Loathing in Las Vegas.* They loved riffing with the Voltairean pungency of Frank Zappa's lyrics. Now, nihilistic humor had become an anathema.

Several weeks after my eldest son's transformation, I found him in the garage using a hammer and an empty barrel for disposal as he destroyed his modern jazz and early rock record collection. He ridded himself of all of his fiction and most of the nonfiction books in his young but relatively large personal library. His new energy and high purpose emerged as a clearly defined set of rules of behavior, a strong stand against abortion, frequent talk about the need to escape from the contaminating influence of MTV culture, as well as our years of talk about the biological and physical sciences. Both boys were particularly critical of my Darwinian flavored attempts at scientific explanation of man's inner life using the selective and adaptive neurobiology of brain mechanisms and behavior. They spent increasing amounts of time with Church friends, seldom seeing their old ones. The eldest's college goals turned from plans for a U.C. Berkeley equipped career in literature and creative writing to a none spiritually challenging, objective and practical, Christian free market finance and accounting degree from U.C.'s Business School.

Gone were shared magical hours of intellectually stimulating, humorous, even scholarly discussions. In place of evidential talk in areas of philosophy,

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literature and science, their opinions and claims derived exclusively from biblical quotation. Their particularly favorites were Paul's letters and some of the later prophets, particularly Jesus-auguring Isaiah. "In the beginning was the word..." became the real reality. The meaning of life was Scripture as explicated by their *book church* pastors. They scribbled notes in the margins of their Bible pages during sermons They were displeased when I interpreted the wild imagery and *666* symbolism of *Revelations* from the point of view of the historicity of encoded political messages, meanings hidden for the safety of the early Jews in their world of Greco-Roman governance. Twenty-five years, before the glut of books by Tim LaHaye, my well-educated sons claimed that *Revelations* was literal and foretold the coming *tribulation* that augured the end of the world and ascension to heaven of the believers. My youngest, since childhood a well-read history buff, now viewed New Testament scripture as sui generisly, divinely and literally true. They said the conduct of their lives their meaning had been clarified by the biblical truths revealed to them by The Book. What I did not say was that much of the talk seemed to me to be an intellectually and spiritually impoverished miasma of cant and righteousness. At the same time, their remarkable transformation appeared to be the expression of a powerful and mystical force, the scientific understanding of which has been the ostensible focus my life's work. Why did their alterations appear so alien, strange and forbidding?

Born to a home of psychoanalytically and scientifically oriented political liberals, these precociously bright and worldly sophisticated young men were suddenly transformed into, unrecognizable to me, radical Christian Fundamentalists. They are now in their late thirties and remain just as ardent, Christian patriotic, Right Wing voters to this day. The eldest is now an executive in Morris Cerullo's San Diego based, worldwide missionary movement, raising money for revival and media ministries. He travels to and is involved with hundreds of Fundamentalist Christian churches in countries ranging from Argentina and Africa to the Middle East and Russia. He hasn't allow me to contact his children, my grandson and granddaughter, because, in vague talk and mostly silent implication, I and people like me are seen as sources of potentially satanic, worldly

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contamination. He feels wronged by the way I am. He once chided me about what he saw as my futile spiritual search in what he called the "health food" Eastern and brain religions. My youngest, only a little less ardent and critical, visits occasionally, and, hands in the air and *speaking in tongues*, prays to the Lord for my salvation.

Of course, this sudden and long lasting personal transformation in the direction of *Fundamentalism* is well known and almost commonplace in modern American and European Jewish, Christian and Moslem college educated middle class families. The Saudi Arabian World Trade Center bombers were, mostly, well supported children of the educated middle class We recall the famously tragic American radical Moslem, Richard Reid, the would be airplane shoe bomber. My stomach clenched as I heard Richard's sophisticated and obviously caring father share his confusion and struggle to rationalize what had happened to his son. The commonality of this kind of spiritual and life transformations in the educated young makes each event no less painful. On the other hand, we know that healing transformations in the name and spirit of the Christian God can lead to quite positive realities. They are effective in even quasi-secular disguise as in Alcoholics and Narcotics Anonymous, Synanon and in the rehabilitation of the Charismatic Christian, ex-alcoholic, Southern Methodist politician, George W. Bush.

Paul Holmer, Professor of Theology at Yale Divinity School gives thanks to the *evangelicals* who "...keep alive the radical breach that the gospel is from the *nous* of this world...they (*Fundamentalists*, *Evangelicals*) look marginal if you are churchy...intolerant if you are ecumenical...anti-intellectual if you are trying to systematize... in their roughness and ...abrasiveness." I bring personal and painful witness to these claims. To get to the personal meaning and mechanisms of these transformations, I had to start from somewhere. I am wedded to the belief of the Jewish ecstatic, Abraham Abulafia, and not those of Moses Maimonides, that the human mind in an altered state of *activated intellect,* man's *Nevesh*, can understand such mystical happenings. I would continue to work at it.

One of the early personal church experiences with my sons' religious path came after accepting an invitation to go with them to a Sunday service at their current charismatic church. By then, the eldest was married with children, the

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youngest, unmarried, was teaching bilingual mathematics in high school. I had waited several years for this occasion.. The meeting took place in a large, gray, unmarked warehouse building that was crowded in back with high stacks of storage cartons. The large, cement floored, open space in front of the storage boxes was occupied by rows of metal folding chairs. They faced an unadorned, elevated wooden platform upon which was a lectern and microphone. Behind the lectern stood a casual array of a dozen or so young people, singing hymns and playing a variety of instruments. These included piano, two or three guitars and upright bass, tenor saxophone, trombone, trumpet, mouth organ and two snare drums. Sounding a bit like a Salivation Army Band, they played and sang, "They cast their nets in Galilee just off the hills of brown; such happy simple fisher folk, before the Lord came down…the peace of God, it is no peace, but strife closed in the sod. Yet let us pray for but one thing, the marvelous peace of God."

The building, used for commercial storage, packaging and mass mailings during the week and a *Charismatic Christian word church* on Sunday, was located at the rear of an unfinished strip mall. A new and well-polished yellow Cadillac Deville was the only vehicle parked in the no parking zone immediately in front of the entrance to the warehouse. My youngest explained that the car belonged to Carl Austin, the self-discovered and declared pastor, who spontaneously *rose up to lead* without academic religious training or a conventional ordination. The bright yellow car was explained as evidence of the power of God. Paraphrasing Mark, my son told me "…he who does not doubt in his heart and believes that those things he says will come to pass, he will have whatever he says…whatever things you ask for when you pray, believe that you receive them, and you will have them." The car served as a glorious instantiation of the church's major promise of the rewards of faith.

Pastor Carl Austin, a tall, blonde, portly man in his early thirties with a resonant tenor voice, was the youngest of several children of a poor Midwest farm family. He had been a state college drop out and without a career or a job. His sermons contained stories about how he had caught spiritual fire at a revival meeting conducted by Kenneth Hagin of Kenneth Hagin Ministries, aka Rhema

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Bible Church, Tulsa, Oklahoma. The pastor's witness of the Holy Ghost acting through his life was his personal cure, by transformative Grace, of a triad of self-destructively sinful addictions: alcohol, gambling and promiscuity. Self-chosen and self-declared, he now served this two and a half year old growing congregation of over 200, mostly young, working families. The young men in attendance at the warehouse church were in shirts and ties, very unlike the more casual garments of even dressy occasions in Southern California at that time. Women were dressed simply and modestly. Most of the children were in Sunday school in a small neighboring store in the strip mall during the adult service. The few that accompanied their parents were remarkably well behaved I was told that most families tithed 10% of their income. They quoted Hebrews, "...king of the righteous...to whom also Abraham gave a tenth part of all...." They believed that their tithe would be returned manifold and the yellow Cadillac Deville served as Pastor Carl Austin's personal evidence. From these funds, the congregation supported the pastor, his car, the rental expenses of the Sunday warehouse church and an orphanage in a small Mexican border town. Some of these children, several neurologically disabled, were bussed to the Sunday service for healing. They sat together in a section in the front of the congregation and were the beneficiaries of the second Sunday collection plate, passed around after the first one that was designated for the church and its pastor.

The first Sunday sermon I heard in the warehouse followed several awkward minutes of Pastor-directed warm up hugs of neighboring strangers while the choir sang hymns. The songs were accompanied by instruments playing the melody in unison sans harmony, and accented by the beats of two loud drums. As the volume and pace of singing increased, I saw several episodes of ecstatic looks and fainting, *dying in the Lord* and *shouts of praise* with *upraised hands*. The intermittent elevation of the hands during prayer and song appeared to be spontaneous. I was told that the arms were up as antennae, feeling the energy of Lord all around us. The pastor's topic was *forgiveness.* From *Ephesians*, "...let all bitterness, wrath, anger, clamor, and evil speaking be put away from you, along with all malice... be kind to one another, tender hearted, forgiving one another, just as God in Christ

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also forgave you." In the middle of his sermon, which built slowly in tension and volume, the pastor introduced a forty-ish, sparkly eyed, somewhat overweight, dark haired, slightly made up woman who the Pastor said was a witness for the ultimate in Christian forgiveness. She was someone from whom all of us could learn. She was the mother of the 7-year-old boy that he, the Pastor, had, four years before, accidentally killed during a drunken driving episode in his "other life." That was the one he was living before he was saved. I was told that he presented her in a service at least once a year. The woman said that her successful struggle for forgiveness led to her being saved. She quoted Ephesians, "And you who were dead in trespasses and sins hath he quickened." She looked radiant and hugged the pastor. When my sons introduced me to him as we filed out at the end of the service, the pastor told me that my visit was important to the congregation. He told me that Jews were special in Charismatic Christianity since we would play an important role in the *return*. He said he hoped he would see more of me. My boys seemed pleased to have invited me.

I accompanied them to their church most Sundays, and often for what they called the "rock and role healing services" on Wednesday night, for over two years. Within three or four months I found myself, the first time while awakening out of a deep sleep, mumbling sounds that I was told sounded like some unknown language, I was praying in tongues. At some services it happened spontaneously accompanied by an almost ecstatic feeling accompanying the surrender of willful control. This was usually accompanied by the release of new energy. I recall thinking that the spontaneous, nonsensical linguistics shorted out my verbal and obsessionally logical left brain allowing the unbridled expression of my hysterical right brain. Sometimes in agreement with an insight offered in a sermon or when particularly moved by a hymn, I found my hands lifting skyward, right hand and arm higher than left, with a high feeling of trust and delicious surrender of conscious cognitive control.

Reading the *New Testament's Acts*, I learned that we were re-enacting the scene of the *Apostles* in the *upper room*. Those gathered there were the ones chosen by the risen Jesus to be able to see Him, the list including Peter, James,

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John, Andrew, Philip, Thomas, Bartholomew, Matthew, James, Simon and Judas. "...they were all filled with the Holy Spirit and began to speak with other tongues, as the Spirit gave them utterance..." The secular psychoanalyst in me tried to make an analogy with the joyful jazz lyrics of Ella Fitzgerald's scat singing, I'd done a little of that during my small jazz group pianistics as an a adolescent. I thought about how verbally paralyzed stutterers could be articulate when singing what they mean when they could not talk it. I wondered about the relevance of the spontaneous *poetry of slams* and *Hip Hop rapping*. We attended what my sons called *charismatic black Baptist churches* in South Los Angeles and Long Beach. These often four hour services usually featured two wonderfully harmonic echoing choirs with organ and drum punctuation of the speech-singing, sermonizing Reverend. Large and beautifully dressed black women sang operatically and danced gracefully down the aisles. I joined my sons in this *joyful noise* for these long services and, exhausted, I was forced to go home for a Sunday afternoon nap.

In spite of what could be regarded as validating experiences with the real life Holy Spirit, I continued to be generally confused and even more deeply estranged. An inner voice kept recalling my spiritual failure as a parent and being traitorous to my Jewish ethnic identity by Christian church attendance. I tried to understand how my sons had traveled from where I thought we were living together to this entirely new world. How did it happen? Could the path going there and back be meaningfully reconstructed and then reversed? This idea is consistent with the medical dictum that knowing the cause, the treatment logical follows. My education had shown me such assumptions of reversibility need not be true.

Contrary to the beliefs of early physical mechanics, medical psychiatric history takers and psychoanalysts reconstructing childhood events, the modern physics and mathematics of complex systems says *phase transitions in complex systems* are probably not reversible, at least not simply so. One of the features of global changes in complex systems, often called *bifurcations* or *phase transitions* (think heated water going suddenly to a boil), is their dramatic discontinuities in behavior. Knowing only the initial and end state, *phase transitions in complex systems* do not allow for *point-to-point backtracking* or *specific linear-causal*

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understanding. These *discontinuous and global transformations* are the stuff of miracles, especially for physicists. Even with respect to initial and end-states, rather than using straight forward phenomenological observation, the *mathematical and physical theories of phase transitions* are usually dependent on not necessarily intuitive, derivative physical quantities. Their verbal representations are often not concrete but metaphoric. This retreat to derived and abstract, far from the primary data computables, may be more evidence of man's many insufficiencies in understanding of the mysteries that are often placed in the spiritual realm.

* * *

Driven by an effect that contributes to cause, like the faith-driven abandonment to God that generates more faith, a drop of water hanging from a faucet is pulled down by its own gravitational field as the thinning neck of the drop facilitates its own further thinning. A gobbet connected by a thick neck to the main drop begins to separate. The neck between them thins and breaks, and one becomes suddenly and irreversibly two. A *continuous* structure has suddenly become *discontinuous in finite time* at what is called a *singularity*. Since the single measurable feature that dominates the water's behavior around this singularity is the *diameter of the thinning neck*, a *derivative physical, one-dimensional observable,* neither the details about where it all began (called the *initial conditions*) nor the *path* it followed to get to the moment of fracture, are predictively relevant with respect to the *sudden transition*. Considering this kind of phenomenon going on in our brains, choosing between theories of behavior that involve changes in brain cell groups and/or brain chemicals versus those that involve behavioral quantities, may be neither possible nor necessary. The challenge is to place the problems of cataclysmic change in brain and behavior in sufficiently abstract and universal terms that can be represented in some low dimensional, computationally accessible space of variables.

The *simplification and stereotypy of behavior around singularities* reduce the number of features that are required to discuss the dynamics of change in what

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would otherwise be a complicated beyond reach situation. One of the properties found around singularities, is the *loss of absoluteness in contextual characteristics* such as the *scale* of the observation. We no longer can say that what we are studying happens in inches or miles, in seconds or days, now or in the past. In the place of a single unit of relevant measurement, we have a distribution of spatial and temporal feature sizes that stretch toward both the infinitely small and the infinitely large.

We can illustrate a dynamical transition involving the *passage of the system through a singularity* by using the metaphor of another kind of water experiment. If we pour a small amount of water through a filter full of coffee grounds, or watch our coffee maker do it, the first spurt of water makes an incomplete path of wet grounds in the bed of dry ones. The next bit of water soaks this path more thoroughly and may form additional and multiple, new and branching, incompletely penetrating paths. Eventually, on just one more of these pourings, a connection in the paths occur, such that the water snakes all the way through the coffee grounds and the first brown drop of coffee falls into the pot. At this flow singularity and opposite to the dynamic of a faucet water drop, *a discontinuous system of pathways becomes continuous in finite time* in a process called *percolation*,

Trying to set up a predictive model, we can count the number of water deliveries that occur before the first drop finds its way through. Repeating the experiment many times yields a span of the number of pours required to reach the singular point of percolation. If we do the experiment enough times, the distribution of the number of pours required to reach percolation will range from one toward infinite. In the *neighborhood of the transition*, time as recorded as the number of small pouring events may stretch.

In aa comparable system, as elegantly described by Detrich Stauffer in his Springer-Verlag book on *percolation,* multiple hot spots in the woods can suddenly fuse into a forest fire. Isaiah said, "...glorify the Lord in the growing fires of dawn..." Faith fires spreading through a faithless dense forest, its hot irregular front damped by the disbelief of water-filled leaves, or disillusionment gaps of already burned out trees, can, under the right motivating conditions of dryness, wind velocity, tree

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density, kindling temperature and desperation-induced willing of faith, sweep through the entire woods in a sudden blaze. This is the *spirit of percolation*. Computer simulations of percolating blazes generate a *multiplicity of life times* of forest fires *near the singularity* that represents the *transition to a global conflagration*.

Mentioned previously is Rudolf Otto's 1917 book about the characteristics of religious experience, *Das Heilige*, *The Sacred*, which described phases in the discontinuous transition from everyday life to the *wholly other* (*ganz andere)* reality of the world of the sacred. They include intense, numinous experiences of fearsome ambiguity, dawning awareness of awesome mystery, revelation and appreciation of the majestic power and finally, entrance into a reality of an entirely other place and time than the natural and secular which Mircea Eliade called *profane.* In his 1958 book, *Patterns in Comparative Religions,* this well-known historian of religion called the revelatory occurrence of sacred reality an *hierophany.* Eliade's classic work, *The Sacred and the Profane,* contrasts the homogenous, spiritually formless and relative world of the profane with the results of passage through spatial and temporal singularities to a place and time that are not of this world.

Poincaré said that the brain did not know of *absolute space*, but rather established a model of it through internal reconstructions of sequential sensory experiences that accompanied our exploratory movements. Activity generates the internalized, *partial differential*, *equations* (describing changes in the observable with motions in space) required for representing the dynamical cartography of the world. It was Poincaré's habit to *topologize the dynamics of motion* in mathematical problems that lacked *analytic solutions*. In this way, simple algebraic operations replace some of the insoluble problems of the calculus. Eliade's *sacred space* defining *singularity in the plane* that breaks profane homogeneousness, a center point that is no longer a circle, can be viewed also as Poincaré's *topological center*. His topological brain theory found expression in the formal representation of internal space as the invariant product of an organism's *displacement groups* of imagined or real physical movements around such *singular fixed points*. The operational object called *groups* defines this kind of algebraic, mathematical structure and motion.

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associated with the loss of habitual temporal-spatial contextual moorings. A mind at time one and the same mind at time two are unconnected. They are *wholly other*.

In much the same sense, for Eliade, *sacred time*, like space, is neither homogenous nor linearly continuous. *Sacred time is circular, recoverable and reversible*. Past, primordial, mythical time can exist in the present. Religious festivals are recurrently ontological, allowing the recovery of the sacred time such that their past and present expressions are the same. *Rebirth is new birth*. In the language of the North American Indian Tribe, the *Yokuts*, the term for world (cosmos) and year are the same. A year and the world has gone by, only to start again. The *Dakota Tribe* says that the Year goes around the World. As Elaide has said, "...at each New Year...the world (is) recreated and to do this is also to create time...the sick man becomes well because he begins life again with its sum of the energy intact." *Healing by becoming another or renewed self* may become a frontier science in the yet unexplored field of *phase transition medicine*.

The quality of separateness, *discontinuity in states*, as occurs in the *same-different inside world*, is much like that found in the *stages of anesthesia*. Each stage of anesthesia is *ganz andere* from the others. In *Stage I anesthesia*, fast frequency, low voltage brain waves are observed and accompanied by a two Martini-like, mildly activated, sedated but exhilarated high. *Stage II*, the next deeper stage of anesthesia, is marked by the sudden emergence of intermittent bursts of high amplitude brain waves, and animals and man demonstrate bizarre postures, hallucinatory phenomena, fixed staring, and sometimes movements that look like acting out some symbolic drama. This stage marks the beginnings of the loss of responsiveness to painful stimuli. In the sudden drop into *Stage III*, a low voltage mix of mostly slow and some fast brain waves can be seen associated with depressed consciousness, complete insensitivity to pain, slow regular respiration and an unexcitable cardiovascular system. *Stage IV* is the deepest stage of anesthesia. This state is characterized by very low voltage, almost flat brain waves, a loss of spontaneous breathing, the collapse of blood pressure and, finally, cardiac irregularities and death in cardiac arrest. These are both *discontinuous and global brain state phase transitions*.

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primary process by Freud and his followers. This forgotten language of the unconscious, an archaic needs and fear-driven tongue lurking beneath our supposedly objective discourse, comes to dominate themes of communication in the middle of these unfinished spiritual transitions. The *Rorschach Test* of master meditaters and LSD users overflow with conflictual primary process images, as does the talk of patients on the verge of schizophrenic decompensation. The primitive symbolism of *primary process* provides the major current in the overwritten prose of the hyper-religious temporal lobe limbic epileptics described previously and called the *Geschwind Syndrome* and in the regressed and iconic transference concerns of patients with tendencies for global and sudden phase transitions, prostitute to saint, righteous obsessional to conscienceless psychopath, called *borderline personality disorder.*

Primary process represents a dynamical brain state, one unburdened by linearly predictive connections with reality. It is a state without even a transient single defining physical time or other fixed measure of order. It is without the causal logic or knowledge of an outside reality that a brain implies in supposing to know. Its primitively instinctual style and goals contrast with more physically time-locked, reality oriented thinking which Freud called *secondary process* and Penn-Lewis referred to as ordinary and religiously lawful "reasoning faculties."

An *absence of absolute time and space scales* with which the *executive ego* orders internal and external time and events, and therefore their relations, results in *primary process thinking* characterized by *condensations* of several, often incompatible, representations into one. Dueling, conflictual and simultaneous feelings and thoughts float from their relevant objects to others. In the *transitional transcendent state*, there may be confusion of self with others, of objects with their labels, of parts with the whole and of symbols with the things that they symbolize. This facilitates living in the spirits of the Father, the Son and the Holy Ghost at the same time. Mixed inextricably with saintly awareness and charisma, there are signatures of instinctually driven and configured primary process. Freud's classical work on *slips of the tongue* concerned the intrusion of these instinctual thought stream condensations from the world of the *ganz andere* and displacements into

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everyday life. In this intense and quasi-fluid state, saintly priests slip seamlessly into sexual predation; an ecstatic Jewish Orthodox fundamentalist shoots 29 praying Moslems in a cave near Abraham's burial plot for Sarah in Hebron; what were lovingly mystical, Jelaluddin Rumi's Afghanistan (Balkh) descendents become people bashing and women stoning morality police; committed and mesmerizing Christian televangelists attend peep shows and seek child pornography; devoted Islamists crash airplanes into tall New York buildings.

In the physics of *condensed matter*, two common forms of multi-molecular or polyatomic *cooperative arrangements* are the *crystalline condition* and in some ways its opposite, the *amorphous glassy state* that results from rapid cooling through a melting temperature. The *microscopic atomic arrangement in glasses*, in contrast with the *crystalline state*, exhibits no spatial periodicity or long-range order. In contrast with fluids, the friction of passage of molecular elements of glasses past each other, their *shear viscosity*, is large enough such that their macroscopic shapes are maintained in the very slow flow for very long times. In-between the crystalline and glassy states their exists a multiplicity of possible *unstable arrangements* which result from what physicists call *frustration*, the *inability of a system to find a unique, lowest energy, ground state*. The generic example of a *ferromagnetic crystal* has two types of ordering principles: (1) The mutual alignment of the atomic *magnetic moments*, visualizable as the lining up of dipole, positive to negative, magnetic arrows; (2) The geometric crystalline low energy ground state described above.

When the *symmetry of these two ordering principles are incompatible*, imagine an arrangement of neighboring atoms that prefer anti-alignment of the magnetic moments which are placed on a geometrically triangular rather than a square lattice, there is *no single arrangement that can satisfy both magnetic and geometric principles.* What emerges in this *state of frustration* is the potential for a *multiplicity of nearly equal energy states*. Water has the potential for both geometric ice crystal symmetry as well as arrangements of hydrogen proton (+) to oxygen electron (-) magnetic moments (with well-ordered oxygen lattices but disorder among the hydrogen positions). It is therefore not surprising that a *multiplicity of*

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indirectly by my sons and church elders about joining a study group for personal conversion.

I was surprised to learn that discussions of current political topics were a regular part of these discussions as well as the Sunday and Wednesday night services. We received a weekly political action committee report. Their issues involved abortion, school vouchers, sex education in schools, family planning, school prayer and carefully chosen Christian elected officials for school boards and the Congress. As a congregation, we frequently held hands in small circles and prayed for the electoral success of our issues and candidates. Twenty years later, this movement has evolved into the public political morality play of the Republican base of George W. Bush.

Laying on of hands, dying in the Lord, speaking in tongues, dancing in the aisles and praying with up stretched arms were routine in the hymn dense services. The goal for all was the *spiritual transformation of mind* as in Romans, "…be not fashioned according to this world, but be ye transformed by the renewing of your mind that ye may prove what is the good and well-pleasing and perfect will of God…" The pastor told us that the world ruled mind could not grasp spiritual things as in Corinthians "…they are foolishness unto him and he cannot know them, because they are spiritually understood."

My research took me to a collaborative project at a European mathematics institute for three months. I returned to our town very late on a Saturday night. I planned to surprise my sons by appearing at their usual choice of the middle service the next day. I drove up to the warehouse church fifteen minutes before the service was scheduled and found that the parking lot of the strip mall was nearly empty. There was no Cadillac parked at the front door. I banged on the double door when I found it locked. More then a little surprised, I called my eldest. He told me that four weeks before, the pastor disappeared, I later found that his disappearance accompanied that of the congregation's bank account, and no one knew where he had gone. He had not warned or informed anyone in the congregation about his plans. Calmly and without apparent awareness of my surprise and distress, my

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eldest asked me if I would like to attend the late Sunday morning service at their newly chosen Charismatic Christian church. He gave me its address and told me that the service started at 11:00 AM. There still was enough time for us to meet there. I wondered how the Pastor Carl Austin would use this incident in sermons about sin and redemption to his next congregation.

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CHAPTER 7:

AMPHETAMINE ROLL-UP AND SPLITTING

We try to understand the metaphysics and inner dynamical life of the committed, judgmental, fundamentalist believer. In these sacerdotaly rigid and faithful, disenfranchisement and righteous intolerance toward other denominations are simultaneous with spiritual compassion, mercy and forgiveness for the members of their own. This *splitting* between the good people and latent evil doers is seen by psychoanalysts and dynamically oriented brain scientists as an all too common, sometimes psychopathological, solution to the inevitable ambiguities of living. I am certainly not alone in being fearful of Fundamentalists: Jewish, Christian, Moslem and Hindu. From the overpass above the freeway, bearded Jewish Orthodox men rained rocks onto the roof of my rented car because I was driving on Sabbath. A research project had taken me to Jerusalem Mental Health Center's neurochemical laboratories for collaborative work with mostly secular Jewish scientists. *Halachic considerations,* those of Jewish lawfulness, comparable to the constraints of *Muslim shirah*, forbids working, even driving, on the Sabbath. Orthodox Jews live walking distance from synagogues or benefit from a *rabbinicaly blessed, network of symbolically covered walkways* for going longer distances on the Sabbath. This

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Sabbarian grid of permission obviously did not cover driving on the free way to the mental health center.

It is the *splitting* of *us* from *them* that leads to the breakdown in empathy and compassionate identification with others. Studies of the dominance of direction of rotation within a closed space in small mammals have shown that *amphetamine-induced intensification* makes the choice of right versus left (or left versus right) rotation, *broken symmetry*, more statistically significant. In contrast, the Hefner Foundation of Switzerland has shown that *entheogenic drugs* such as *psilocybin* in man facilitate seeing both of the conflicting, simultaneously presented, right eye and left eye images in place of the usual dominance of just one of the two representations. A precondition of *compassion* might be that a person's brain be able to see and comprehend both or several sides of apparently conflicting points of view at the same time. The Fundamentalists do not see things that way. In the Koran, Mohammed says, "...give sustenance to the poor man, the orphan, the captive...and for the unbelievers We have prepared fetters and chains and a blazing fire...." In the New Testament's *Mark* we find the final words of the risen Jesus, "...whoever believes and is baptized will be saved but whoever does not believe will be damned." The Crusaders' claimed scriptural support for their murderous marches to reclaim Jerusalem.

Carl Jung wrote about the New Testament's *Revelations* in his *Answer to Job*: "...a terrifying picture that blatantly contradicts all ideas of Christian humility, tolerance, love of your neighbor and your enemies and makes nonsense of a loving father in heaven and rescuer of mankind. A veritable orgy of hatred, wrath, vindictiveness and blind destructive fury that revels in fantastic images of terror breaks out...overwhelming a world which Christ endeavored to restore to the original state of innocence and loving communion with God..." As Princeton University philosopher, Walter Kaufman, has noted in his *Religion in Four Dimensions* "...compassion for unbelievers is implicitly condemned and proscribed...Augustine argued expressly against compassion for the damned and Luther used invectives against his (religious) enemies..." How can this be God's

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setting for the spiritual work toward that promised in *John* "...that you love one another; even as I have loved you, that you also love one another."

In contrast with what has been described in previous chapters as the *entheogenic drug-induced transitions to a spiritual mind,* one is tempted to describe these Fundamentalists' states as the *amphetamine religions*. The Los Angeles Ram's Hall of Fame defensive end, on very high doses of amphetamine (125 milligrams compared with the diet dose of 5 milligrams) taken four hours before the Sunday games, the Baptist minister, Deacon Jones, used his famous and consciousness annihilating head slap to daze the opposing offensive tackle in order to gain access to and injure the other team's quarterback. Before taking the handful of *Dexedrine spansuls*, he would tell me, "See you on Tuesday." Along with the Deacon's destructive aggression was the other invariant feature of the actions of high doses of amphetamine, *compulsive stereotypy*, the fixity and driven repetition of over simplified actions and thoughts along with the loss of breadth of vision and adaptive flexibility. Deacon consistently *rushed inside*, *took the inside lane*, in spite of offensive linemen, who having studied previous game films, being set up to expect his route. They used this knowledge to take him out of the play. In modern theological parlance, judgmental rigidity and thinly veiled disapproval take the place of the more flexibly curious and lovingly humane feelings of the participants in the evolution in spiritual understanding of today's *liberal Protestant process religions.* These are the ones that believe that the properties of God evolve along with our biology, our brains and our growing scientific understanding of ourselves and the world.

Angry splitting is not just a stimulant drug effect. Recall my experience of the sudden emergence of a *first second wind* after a mile or so of my daily ten miles of running. It was frequently accompanied by inner bursts of obsessive, paranoid thoughts. Taking five milligrams of amphetamine felt much like the *first second wind*. I am full of energy with arrogant feelings of power, mind fixated in grand and simple ideas that I believe to be absolute and correct. I feel irritably intolerant about anyone or anything different. It is my virtuous duty to set everyone straight.

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In the 1980's, Moishe Zar, a desert castle dwelling, settlement organizing, ardent Orthodox Jewish Zionist, now 65 years old, was the leading vigilante of the West Bank He planted bombs in the cars of Arab mayors and plotted to blow up the Dome of the Rock. Buying up farmland from the Palestinians beginning in 1979, many of whom were then killed by their own because they were seen as collaborators, Zar and his group of young volunteer settlers took over harvesting the Palestinian's olive trees and shooting rifles over the heads of those that would take them back. Fundamentalist Christians share his vision that the coming of the Messiah, the second for Christians, the first for the Jews, is dependent upon the complete return of all of the land of Israel to the Jews.

I recall that in the middle 1940's, my father took me to a fund raising dinner for the local chapter of the *Jewish Antidefamation League*. The whispered talk was about blowing up a warehouse in which anti-Semitic pamphlets were stored, planned for the middle of the night when it was unoccupied. Even at the age of 10, I could tell that their quiet anger and firm commitment made these threatened men feel less vulnerable. I understood a little more about the motivation for this proposed nighttime property destruction when, the following year, my father explained the reason for our being refused overnight rooms at several motels as we drove along I-95 in Southeast Florida. It took us until late night to find a place to sleep. This was America's muted version of what Hitler and his legions were doing to Jews that, at that time, was not generally known, except for Walter Winchell, in America. Resonant with our chemical-cultural theme are the many reports that Hitler was taking an amphetamine drug, *Benzedrine*, daily and in high doses for the last 20 or more years of his life. One can hear the characteristic, amphetamine-induced, higher pitched, rants in his recorded radio tirades. Compare the pitch and strained voice quality of the singing of Bob Dylan in his early records made while he was on *speed* with the gravely, much lower pitched voice, now that he is not. In our behavioral neuropharmacology laboratory at the Brain Research Institute at UCLA, Professor Charles Spooner and I used an *audiographic oscilloscope* to monitor the sounds of baby chicks whose peeps became higher in pitch and rate following injections of amphetamine. The earliest members of the methadrine-amphetamine

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chemical family were synthesized by the great organic chemists of the German pharmaceutical industry in the early 1930's.

The sequence of parallel streets in the neighborhood of my home and first grammar school in Kansas City, Missouri were my street, Virginia, then Tracy, Forrest and Troost. My school, Bancroft Elementary, was on Tracy and one block down that street was the Lutheran Day School established by German immigrants under the aegis of the Missouri Synod. Starting in the third grade in 1943, I was intermittently and unpredictably chased by rock throwing, "damn Jew" and "Christ killer" shouting boys from the Lutheran Day School. I had my choice of running for safety directly from Tracy to my family's half duplex at 4232 Virginia Street, or moving away from school via Troost and then down several blocks and around to sneak back to my home on Virginia without being spotted. One run-for-it afternoon, my parents took me to the emergency room of the Menorah Hospital to have my scalp sewed up where a sharp rock had landed.

When I asked my synagogue's young people's spiritual counselor, Rabbi Kleigfeld, to explain the feelings and actions of these children of Martin Luther's Post-Reformation Christian Church, he answered that I already knew about similarly difficult places and times of our Twelve Tribes' like Rome, Medieval Europe, the Spanish Inquisition, Persia (Iran) and, it was rumored, in Germany as we spoke. "Conversion or death" was its most benign form, in places like Spain and Iran, many Jews faked it, staying alive and practicing Judaism secretly. Kleigfeld told me that the causes of this historical theme of persecution of Jews were complex.

Among the frequently unmentioned events recorded in the later part of the worldly life of Mohammed, who lived from 570 to 632 AD was, "...in the name of Allah, the Compassionate, the Merciful..." his participation in the crushing of the Jewish tribe of al-Nadhir in 626 A.D., the beheading of 800 Jewish men of the tribe of Qurayza who refused to accept Allah as their God in 627 A.D. and putting to the sword the Jews of Khaybar in 629 A.D. As in the section of the Koran called *The Cow*, Mohammed proposed to "...fight against them (the infidels) until idolatry is no more and Allah's religions reigns supreme..." In contrast, the more entheogenic spiritual orientation of the ecstatic followers of Mohammed in his earlier years

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speaks of the multiplicity of valid *Ways to Deep Truth*. The acceptability of many ways is supported in the tales from the millennial oral tradition of the Sufi Masters in their *Teaching Stories*. One of them, *What Befell the Three*, is attributed to the early 18th Century Sufi teacher, the Dervish Murad Shami. In it, an apparition is mobilized by the concentrated Truth seeking efforts of three *Sufi Dervishes* named *Yak, one, Do, two* and *Se, three.* When this "...white smoke head of the very old man..." was asked what he was, he answered "...I am what you think me to be...have you never heard the saying 'There are as many ways to the Deep Truth as there hearts of man.'" In the narratives about the lives of the *Mevlevi Islam dervishes* called *Munaquib el-Arafin* (1353), *Jalaludin Rumi*, the Sufi saint, instructs his ill and troubled petitioner to ask forgiveness from the Christian he recently spat on saying "...whether a ruby or a pebble, there is a place on His hill, there is a place for all..." Cole Barks and Michael Green's *The Illuminated Prayer* (2000) notes that the Rumi follower, *Bawa Muhaiyaddeen*, a modern Sufi guru, was said to be keenly aware how quickly spiritual *entheogenic systems can become amphetamine-like* and "...develop rigid marching orders ...which turn into a dumb obsession with other people's behavior..."

It appears that entheogenic and amphetamine spiritualities can coexist contemporaneously, in Islam as well as in all the other of the world's great religions.

One day, sneaking home from school, taking the long way around via Troost, I was spotted and chased up some stairs into an apartment building's dark hall. Terrified, I swung hard and hit the leading angry and noisy head with a propitiously found snow shovel that had been left near the apartment's entrance. An ambulance was called to tend to the twelve-year-old, transiently unconscious, Lutheran boy. He recovered completely within a day and the chases after school and my desperate escapes stopped suddenly, never to reappear. After several months, our family crossed the socioeconomic divide in Kansas City to a more tolerant, upper middle class, Southside neighborhood near Rockhill Road, to a suburban home, one block from Missouri's border with Kansas. There, persecution for my Jewishness took more subtle forms such as not being permitted to play teen-age golf with my friends, though invited, on their Blue Hills and Kansas City Country Club's golf courses. It

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was decades later that the first Jewish member of the KCCC was the founder of H and R Block. Unable to afford membership in the single all Jewish country club of the region, I practiced for my high school golf team on Armour Hills Public Golf Course, where, at the time, mostly white working class golfers played.

How can it be that spiritual states include both personal humbleness and loving mercy toward some of mankind and judgmentalness, nonacceptance and commitment to seduction, threat and even violence in the service of invoking changes in the beliefs of others. How can the *high energy calm* of being home at last in the *born again condition* with its new freedom from self assaults about sin, most importantly that of disbelief, but also peccadilloes such as drunkenness, promiscuity and familial abuse, be associated with readiness to judge, harass even persecute others. Psychoanalysts would say that it is a riddance mechanism, the projection of unwanted personal traits onto others. From the standpoint of rational thought, this seems more like non-Aristotelian cognition, two, not either-or, countervailing orientations toward mankind held simultaneously. The newborn parishioners of these *charismatic amphetamine churches* express their fealty to God with strongly held beliefs that diagram logically as contradictions. The perception of the world's peoples into believers and infidels, good and evil, our people and your people, ourselves and the others. It is generally believed among social psychologists that it is the perceived *nonpersonness of others*, which allows the cruelty that empathic identification with them would never permit. *Splitting* feels like resolution, its *stereotypy* reducing the complexity of spiritual thought as well as true to life perception.

A concrete laboratory example of *amphetamine conversion*, the sudden transition to a high energy, fixated, and delusional state called *amphetamine psychosis*, is supplied by experiments in humans conducted by Professor John Griffith at Vanderbilt University in the 1960's. These experiments would not be allowed by today's human research committees or medical ethicists. Each one of a group of psychologically screened-as-normal graduate student volunteers, at an individually unique amphetamine dose, developed suddenly a personally unique and peculiar system of new beliefs, obsessionally held as rational thoughts. Ten

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milligrams of amphetamine were administered to volunteer subjects every hour until every subject crossed their particular threshold for *personality change*. The graduate students underwent a global mind-brain-person transition at differing total doses of amphetamine. The subject's world was suddenly transformed into one of enemies and friends. The syndrome dissipated over several hours when the drug was stopped and the plasma levels of amphetamine and its metabolites declined. As amphetamine makes memory formation and recall stronger, the subjects were embarrassed when remembering what strange and forbidding yet uneatable things they so strongly believed. These included such things as: they as good people were caught in a network of bad person Russian spies; some threatening others arranged for poison gas to be seeping out of the water faucet; the white coated scientists were CIA undercover intelligence officers hoping to get information about their small pornography collection. The subject's world had become divided in, for each person, a stereotyped way.

After a couple of weeks of return to normal living, the experiment was repeated. Each subject again developed his or her individually unique set of good-guy, bad-guy delusional beliefs and at the same dose of amphetamine as before. Like those of strong faith, their ideas once again resisted the logical arguments made by the professional staff: that the new realities were neuropsychological and had an obvious pharmacological origin. While on the drug, all stuck to their story, even while being shown the movie record of their first drug-induced episode. There is reliable scientific literature describing kamikaze pilots on high doses of amphetamine in an ecstatic state of Shinto nationalism. With their planes loaded with explosives, they deliberately crashed their planes onto American aircraft carriers in the Pacific Theater of World War II. One wonders if these drug-induced states occur in the drug-free condition in today's abstemious Muslim suicide bombers.

A more abstract and general way of thinking about the sudden emergence of fixation, repetitiousness and splitting in feelings and thoughts involves the emergence of regular *limit cycle oscillations* in a complex system that was behaving previously in a stable but flexible way. *Locking up* into a fixed, *closed loop*, is a

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common way for electrical circuits, computer programs, brain mechanisms and other complicated systems, even cultural or spiritual movements, to behave when one or more important control parameters crosses a threshold. Doyne Farmer of the Los Alamos's Prediction Company once said about this vulnerability in complex system, "Those things can hardly wait to roll up." The *limit cycle lock-up* occurs most often as a sudden, discontinuous change, called a *bifurcation,* into *autonomous self-oscillations* from an equilibrium state around which there was some random variation. A *bifurcation, a discontinuous change in outcome from a smooth changes cause*, characteristically occurs when the amount of an important influence, a metabolic state, a drug, a psychodynamic conflict or level of emotional stimulation crosses some critical value. The switch from one type of dynamical behavior to another looks like the system has suddenly changed into something else with an *entirely new kind of life* of its own. In the new life *of rolled up, locked-up repetitious motion,* almost all new starting conditions follow pathways that lead into the same limit cycle pattern. Evangelical Christians talk about *all born again life being in Jesus, fixed in a complete set of moral, social and political beliefs, ideas and judgments.* The *limit cycle* gets its name because the end state of the orbits of almost all starting points of the dynamics winds up being drawn into the same fixed, repetitious pattern of a stable cycle. Visualizing the simulation of one kind of *bifurcation to a limit cycle* on a computer screen, we see a slightly jiggling point explode suddenly into an orbit of ceaseless rotations around a circle.

Ralph Abraham, the University of California at Santa Cruz pioneer in graphical approaches to nonlinear systems, describes, cinemagraphically, the emergence of limit cycles from a single point. He starts with a picture of an *attractor* of water flow in the shape of a basin. All water that enters the basin, rolls down its sides to the bottom, to what physicists say represents a *potential energy minimum*. A little more technically, this *attractor basin* is composed of the set of all points such that the orbits that flow from them tend to end up inside the basin as time goes toward infinity, no matter where they start. Changing the value of a control parameter of the system changes the shape of this basin-like landscape, of the surface of the systems dynamical actions called a *manifold,* which can intuitively

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predict how the fluid will flow upon it. If we start with a simple bowl, a *parabolic basin*, then the *attractor* itself is a point at the bowl's very bottom. Changing the value of some influential parameter may induce the sudden formation of a small hill, growing at the center of the basin's bottom. Now fluid flow in the attractor bowl runs down to a path around the hill at its bottom. The autonomous motion of the fluid flows takes place now in a *circular orbit.* The *basin of the new attractor* is the original bowl minus the point at the top of the central hill. The fluid flow around the hill at the bottom of the basin is circular and is called a *limit cycle*. *Note that the direction of the rotation of the limit cycle can circle in one direction or the other*. In some computational simulations, *motion alternates between directions*. This suggests the aspect of the born again amphetamine religions, *splitting.* There is an unstable and intermixed probability of right versus left turning directions and their alternation. This vulnerability to directional *splitting* and often *unpredictable alterations* in action themes can represent what seem to be paradoxical combinations of both good and evil in the same strongly faithful, for example, the apparent bidirectional morality of generous and loving, pederast priests.

These mathematically flavored images of the sudden emergence of a limit cycle in complex systems was made biologically concrete to me by research conducted by one of my first graduate students, David Segal. He is now a professor of psychiatry at the University of California in San Diego. His program of work involved the administration of very gradually increasing doses of amphetamine to rats while their behavior was being monitored and recorded by a continuously running video camera. He documented the behavior of rats in a walled rectangular space within which, without drugs, they first wandered about randomly and then settled down to rest in an individually selected, favorite *home corner*. Segal called all of these phenomena, *patterns of exploratory behavior*. At doses of amphetamine below 2.5 milligrams (mg) per kilogram weight (kg), the exploration of the entire bounded space proceeded faster than was the case with their salt-water treated controls, their paths being more uniformly distributed throughout the box. They spent less time resting in their home corner. At almost precisely 2.5 mg/kg, the rat's behavior changed dramatically into an entirely new pattern of *continuous circling*. As

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was the case in the *abstract manifold* picture of *bifurcations to limit cycles*, some rats tended to circle their chamber to the left and some to the right and switching between them was often seen.

The influence of amphetamine and other brain dopamine neurotransmitter-mediated drug manipulations on *directional turning tendencies* in rats, mice and cats were the focus of brain and behavioral research of Professor Stanley Glick of the University of Massachusetts. The asymmetry of dopamine concentrations in the two sides of the brain, particularly in the *medial prefrontal cortex* and the brain stem's *nucleus accumbens*, predicted both the paw preference for pellet reaching and direction of turning in several studies in rats. These findings were statistically true over a population of rats, but not necessarily predictive for any single one. Reminiscent of the conflict between good and evil in our human spiritual analogy, naturally right turning male rats and left turning female rats, when compared with the opposite paired group, were greater voluntary ingesters of alcohol placed in their water bottles.

Splitting as a part of the phenomenology of *limit cycle bifurcations*, with directional implications for good and evil, has neurological support in humans as well. In the context of contrasting *right versus left hemispheric temporal lobe syndromes*, recall that temporal lobe seizures with a right side excitatory focus leads to the development of the *Geshwind Syndrome*, a high, softly energetic and saintly state of spiritual preoccupation and voluminous writings, loving and generous kindness toward all and the complete disappearance of sexual interest but not sexual potency. A left temporal lobe excitatory focus leads to the development of the *Kluver-Bucy Syndrome* of indiscriminate aggressiveness and hypersexuality. Experimental simulations of this syndrome in cats lead to them mounting and attacking living and nonliving things, even chairs. A variety of manipulations of the symmetry of brain dopamine concentration and dynamics by its characteristic drug, amphetamine, interact with lateral brain lesions such that we conclude that the stimulant-induced limit cycle lockup remains a phenomena influenced by drugs, sex, genetic predisposition and several other experimental conditions. This situation is

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perhaps not so different in variety and complexity from the range of representations in art and literature of the *left hand of evil and the right hand of grace*.

Oscillations that appear spontaneously in nonlinear systems without external periodic input were known to Henri Poincaré in 1882, and were systematically studied and made accessible to non-mathematicians by early 20th Century Russian mathematicians and physicists, well represented by a 1949 book, *Theory of Oscillations* by the Russian engineer-mathematicians, A. A. Andropov and C.E. Chaikin. Another relatively early classic is *Nonlinear Oscillations* by Nicholas Minorsky. The most common form of *transition from a fixed point to a limit cycle* was pictured as changes in the surface of the action, the *bowl-hillock manifold* in the paragraphs above, and is called a *Hopf bifurcation*. Recall that bifurcation means a discontinuous change in an observable over a continuous change in what is known as a *control parameter*, such as dose of amphetamine or intensity of an experience. The mathematical mechanism resulting in circular directional motion represented by the *(eigen)vectorial states*, was named for the German mathematician, Eduard Hopf. His 1942 paper was a mathematical proof of its existence and was discussed in the context of *fluid flows* that role up such that *circling vortices* arise from smooth, called *laminar*, water flow, at a critical value of the flow rate. Hurricanes are another example of these kinds of dynamics.

The *Hopf bifurcation* to *limit cycles* has been found in several, many dimensional, physical, chemical and biological systems. The latter include calcium conductance oscillations in the excitable membranes of muscle, heart and the brain, cardiac arrhythmias such as *ventricular flutter* as well as oscillations in population numbers in foxes and rabbits, predator-prey systems. California Institute of Technology's Professor, James Old and Johns Hopkins Professor, Joseph Brady made experimentally obvious the potential for the rigid irrationality implied by the brain's inclination to be locked up into limit cycle behavior. They demonstrated that animals, from rats to monkeys, could get locked up in apparent self torture, repeatedly and endlessly pushing a bar to deliver current to pain systems in the their brains. These pushes induced almost unremitting screams in monkeys and

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what appeared to be rageful biting and then immobilized resignation in behaviorally depressed rats.

Freud's last paper, *Analysis, Terminable and Interminable* (1939), featured examples of what he perceived to be the unsolvable mystery of helpless psychological entrapment in repetitious patterns of self-destructive behavior. He blamed the Iliad's and Odyssey's villainous immortal, *Thanatos,* the ever-threatening spirit of death and destruction to contrast with the good, life giving *Eros.* The Yiddish word for a personified *Thanatos* is *Moloch ha-Moves*. A range of fixations in self-excitatory, repetitious, self-mutilating behaviors is documented in domesticated animals. Dogs, particularly German Shepherds and Labrador Retrievers, can lock up in compulsive grooming cycles of what is called *acral lick* in which endless licking of paws or flanks lead to the break down of skin into seeping-sore dermatitis, which, in turn, stimulates more licking.

Mark Twain wrote a story about his getting stuck in ceaseless mental repetitions of a catchy, clangy poem. He could not stop reciting it to himself even after days of sleep loss and anorexia. He was finally cured by relating his problem and the poem to his pastor who he then unwittingly heard creating a community epidemic by including the rhyme in his following Sunday's sermon. Psychologists, who study this form of human *mental limit cycle attacks*, call this state of internal, repetitiously recited, poetic stuckness, *earworms*.

There are additional invariants of sudden transformations into spiritual-mind-brain bifurcations into a limit cycle lockups and, as discussed, one of them is psychological *splitting.* In psychoanalytic theory, as first suggested by Freud in his 1937 written and posthumously published paper, *Splitting of the Ego in the Process of Defense* (1940), *splitting implies two simultaneous and contrary psychological reactions*, one can be conscious and the other unconscious. They can both emerge in conflictual situations involving adaptive efforts of the personality to deal with the opposition between some form of powerful instinctual pressure and attendant perceived or imagined danger. Otto Fenichel's *Psychoanalytic Theory of Neurosis* (1950) elucidates multiple manifestations of *splitting of the I* (more technically, the *ego*) into a *conscious* part that knows reality versus an *unconscious* part that denies

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it. In some situations, a logical view contends with a more irrational, magical one. Today, the morning group praying, evening hymn singing, Christian Republican Right Wing feed their feelings of being on the side of God by dividing people into those that are like them and good and those that President Bush and Attorney General John Ashcroft calls the evil doing "bad guys." As noted previously, psychoanalytic theory posits that the evil doing others may represent the projected repository of our own unacceptable impulses and inclinations. It became quite clear in my own psychoanalysis and psychoanalytic training that it is in *healing our split* and knowledge of our own unacceptable things that will lead to our understanding and forgiveness of others.

As we dig deeper into global brain-mind dynamics of *emergent high-energy fixation, stuck repetitiousness and splitting,* we encounter their universality in the structures of mathematical thought. Did we just make them fit? Do these thought forms map onto internal and external physical reality? Are these abstract concepts and operations simply products of our biological brains manifested as psychological mechanics and used to explain to ourselves what we perceive and think? Does a square have external reality or is it a universally imagined something, and, as such, represented only in our minds and the pictures of it we draw? Is mathematical understanding simply inborn perceptual skills combined with developed and practiced logical cognition? Or, do we take the *Platonic view of mathematical relations*: these abstractions are the *ultimate realities,* antedating and persisting through the past, present and future of the universe and omnipresent.

Where can the conceptual boundary be drawn between the physical reality of the Babylonian surveyors use of the *Pythagorean theorem* to calculate distances, that the sum of the squares of the lengths of the two legs of a right triangle is equal to the square of the length of its hypotenuse, and its abstract, pencil-marks-on-paper, algebraic development as in the definition of *Pythagorean numbers*, *a,b, and c* such that $a^2 + b^2 = c^2$. The dichotomy between the abstract and concrete, consistently blurred in our work, is between a *natural science* with ideas that can be disconfirmed, directly or indirectly, by experimental observation and the thinking of mathematics as an *a priori field* in the sense of Kant. The modern Platonic view

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such as that held by Rene Thom is that once accepting a set of *natural givens*, called the *axioms*, the rest of the knowledge of this reality grows in the form of theorems that relate to the axioms and each other through their logical consistency. Knowledge of reality is moved by the ever-forward mathematical refinement of *a priori* conditions to *do away with the theorems' exceptions,* called *counter examples.*

The Hebraic Bible's view of *signifiers* such as words and symbols is close to, but not identical with, the Platonic view of mathematical formalism. According to the Torah, God made the word with words. God spoke and the world became real. The Aramaic for "I create in speaking" is *avara k'davara* , or as the magician says, as he waves his wand over an apparently empty black high hat, *abracadabra*. The Hebrew word for *word*, *davar*, also signifies *thing*. This view contrasts with the mathematical *formalists,* among them Hilbert, who considered the *signifiers of abstract mathematics simply symbols used in a game*, *the rules of which being arbitrary, must include proofs of consistencies among them.* Consistency from the point of view of physics was addressed by Hertz, in *Die Prinzipien der Mechanik,*(1894), where he expressed the formalist theoretical physicist's work as "...within our own minds we create images or symbols of the external objects, and we construct them in such a way that the logically necessary consequences of the images are again the images of the physically necessary consequences of the objects."

In another set of related contrasts, the *constructionist* mathematician will argue that mathematical assertions are only true if they can be demonstrated, found or constructed. In contrast, the *classical school* of mathematics can develop the case for the truth of mathematical statements if they are consistent with field's network of theorems and proofs, even if, up to the current time, no specific example of this truth can be demonstrated. The former can be thought of as a *builder*, the latter as a *discoverer*. For example, suppose we try to make a proposition about *perfect numbers* where a perfect number is defined as being equal to half the sum of its divisors. Using the perfect number 6, we find that its non-identity divisors are 1, 2, and 3 and half of their sum = 6. Our proposition: either there exists an odd perfect number, or else there exists no odd perfect number. An expression of this

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forced decision between yes and no is called the *excluded middle.* The *constructionist mathematician,* an orientation without the excluded middle, asserts that "an odd perfect number exists" would only be meaningful if one could show that such a number had been found or constructed. The *classical* mathematician would find the phrase "no odd perfect number exists" meaningful without a concrete example, if the assumption of its existence would lead to a no (versus yes) contradiction encountered in the proof-relevant network of established theorems and their relations. The symbolic operations of these formal schools of mathematics and their relationship to the objective and ideational realities of brain-mind-spiritual life have been viewed by some as Western cultural products rather than expressions of secular or spiritual Absolutes. Still others have argued that cultural relativism is not relevant here because mathematicians worldwide constitute a monoculture.

With respect to the real world existence of abstract mathematical structure, our Platonic bias must be obvious. The thrilling experience of a new reality I get to know from finally understanding how a theorem works and the rush of peering into the grandeur of the Grand Canyon feel like the same kind of full-of-wonder high to me. I blend them here without reservation. Perhaps this world of spiritual abstraction is closer to the orientation of the school of *intuitionist mathematics.* Its founder, L.E.J. Brouwer, required that every mathematical construction be so immediately apparent to the human mind that no formal proof was necessary. This became my form of *spiritual transcendence, which* led naturally to a *mathematical, mystical faith.*

We carry the explication of this kind of reality further. Reflections of the good and evil, right and left, moral directional biases and their relative weightings in *born again bifurcations* to *invariant circles* called *limit cycles*, can be symbolically represented in what are called the *complex eigenvalues* of matrices describing the system's set of orthogonal motions with changes in their control parameters. The behavior of these *complex eigenvalues* underlies and characterizes the mathematical mechanism of the *Hopf bifurcation.*

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The subject of complex eigenvalues brings up in me the emotionally disturbing subject of *imaginary* and *complex numbers.* I can still feel a little of my earlier anxiety. The episode started benignly enough. Our high school's freshman algebra class was studying how to solve quadratic equations, equations in which the highest power of an expression was two. Told to work at the blackboard in front of the class, I was given the problem of finding the two values of x that were the roots of the equation, $5x^2 + 3x + 4 = 0$. I had been taught to use the memorized *quadratic formula*, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, in which $a = 5$, $b = 3$ and $c = 4$. I always calculated the square root part first and wound up with the expression, $\sqrt{9-80} = \sqrt{-71}$. I can still feel the sinking feeling in my stomach as I looked at the result. I anticipated the usual snide remarks and embarrassment as I contemplated doing what I did not know how to do, *take the square root of a negative number*. Mr. Kirby, the retired mechanical engineer who was my high school freshman algebra teacher tried to help, but I did not trust him. It seemed to me that he had already humiliated me in front of the class, several times. He asked, "… what number when squared, multiplied by itself, would equal *–1.*" He then asked it another way: solve the following equation for x: $x^2+1 = 0$. Seeing something I could do, I wrote the next line quickly $x^2 = -1$ and then, taking the square root of both sides, I wrote $x = \sqrt{-1}$. He then asked me what that meant. I answered by writing quickly, glibly and blindly that that meant that $\sqrt{-1} \times \sqrt{-1} = -1$. He asked me to explain what that meant by giving him an example from the real world. Not yet knowing about imaginary and complex (combine real and imaginary numbers), I stood head down, ashamed and silent, thinking that my smart friend Jerry Blau would get the answer immediately. Mr. Kirby said he would go on with the class while I continued to stand in front of the blackboard and thought about it. He told me to interrupt him when I was ready to answer. Some classmates were smirking, others giggled aloud. They had seen him do this to me before.

Mr. Kirby, a short, muscular man, an ex-marine with a military haircut and a brusque manner, lectured that mathematical competence and obedience to authority and class discipline were all of a piece. I asked him about mathematical

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creativity and he said that this class was certainly not about that. I disliked and feared him. He seemed to feel (and wrote a note to my parents to the effect) that, being "too arrogant" I needed to be "brought down a peg or two." I had gotten the best grades in the first two exams and was enjoying the role of after school tutor for some of my friends. I suspect I was getting pretty egotistical. In class, I found myself eagerly shouting out answers without holding up my hand, behavior that Mr. Kirby met with his characteristic look of fatigued disgust. Twice I was thrown out of class for my introjections. He then began to give me problems that I could not do, for which I was not prepared. This left me standing at the blackboard until the end of the hour, after all the rest of the students had solved theirs and sat down. On parent's night, Mr. Kirby told my father that I needed more "social and intellectual discipline."

Inspired and personally directed hard work and socially defined correct behavior were not synonymous to this arrogant 13 year old who had already brought chagrin to his mother, the conservatory classical piano instructor, with his satirical pianistic jazzy composition called "How High the Moonlight Sonata." I was also a secret reader of the book on the top back shelf in my father's library by Jack Hanley called "How to Make Mary; A Gentlemen's Guide to Seduction." In Mr. Kirby's class, inspired by the book, I sometimes reached behind me, through the crack in my desk seat, to caress the inside part of the long smooth legs and sometimes moist panties of a well developed, tall and beautiful brunette girl behind me. I was never caught and she pretended that nothing was happening. In fact, she never talked to me outside of class. I felt then, vaguely, and now, more specifically, that a content enriched, instinctually titillated and excited unconscious could lead me to the solutions of intellectual challenges if it were both sufficiently indulged and untrammeled, left alone in its work of being itself. Mr. Kirby did not see things that way.

Since then, among my graduate and post-doctoral students in the neurosciences, I have learned that the Mr. Kirby's of modern American educational practice have ruined generations of potential mathematicians and physical scientists. Worse, they have created generations of very bright math phobics who

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run to other graduate fields such as biology and medicine and come to resist the potentially humiliating incursions of new and potentially helpful abstract ideas and operations from mathematics and physics into their fields. They do not want their persecutory versions of Mr. Kirby to take up residence once again in their heads. I can still feel his negative presence during long hours of struggle with the ego deflating feelings of dumbness that an understanding of almost any new mathematical concept requires of me. Holding Mr. Kirby's voice off as long as I can until, sometimes, the wonderful "aha!" experience arrives. I have tried to forgive him since but forgetting him has not been possible.

It turns out that in the world of elementary, physically representative, real numbers, the *square root of a negative number* has no meaning. Such a number has understandably come to be called *imaginary.* Was this the answer Mr. Kirby wanted? There was some conflict among mathematicians in the 17th and 18th Century about the arbitrary definition of $\sqrt{-1}$ as an *imaginary number*. It was symbolized by a letter, *i*, that is $\sqrt{-1} \equiv i$. The existence of *i* extended the range of algebraic definitions so that a solution of the quadratic formula as above could be found for the square root of a negative number. A further expansion of this idea was to that of a *complex number* that can have both a real and an imaginary part. For example, letting letters be generalized representations of numbers, a complex number might be written, *a* + *bi,* real number *a* + real number b times *i,* the letters such as *a, b, c, d…* symbolized real numbers. Consistent with membership in an algebraic system, *a* + *bi* and *c* + *di* can be added and multiplied. This extension of the real numbers into the imaginary realm permitted d'Alembert's and Gauss's proofs (and many, more complete ones since) of the powerful *Fundamental Theorem of Algebra* from which the faith derives about always being able to find at least one solution to an algebraic equation. It was proven that *any n^{th} degree algebraic equation* (e.g. $x^n + x^{n-1} + ... = 0$) *with real or complex coefficients always has at least one real or complex root.*

Closer to an image that helps make *intuitive connections with human born again bifurcations, limit cycles and directional splitting* is the geometric interpretation of a complex number, let us now call it *z*. As above, algebraically, *z* is the sum of a

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real part a, plus b times the imaginary part, *bi*"; that is, $z = a + bi$. We can then set up a *geometric space* to represent *z* by imagining a *two dimensional plane* with the horizontal *real axis* extending from left to right, the usual x axis, and the vertical dimension, called the *imaginary axis*, extending from bottom to top like the standard *y* axis. These two axes, going from negative values to positive ones, left to right and bottom to top, cross at the shared value of 0. Thus *a* and *b* can be visualized as the rectangular coordinates of a point in the plane and the point locates the complex number, $z = a + bi$. Since real parts and imaginary parts are like apples and pears and for addition, like must be added to like, if two complex numbers, $a + bi$ and $c + di$ are equal, then $a = c$ and $b = d$ and their sum is written $(a + c) + (b + d)\, i$.

Now that we've set up a point *z* on the plane, located with a complex number at $z = a + bi$, we can then draw an arrow, called a *vector*, from the intersection of the imaginary and real axis at *0* to this point *z*. Its *length* from *0* to *z*, *0z*, we'll call that length ρ, is the size or amplitude-like *modulus* of the complex number, $z = a + bi$. The *angle* this *0z* vector makes with the real, *0a-axis,* lets call this angle ϕ, is called the *argument* of complex number $z = a + bi$. ρ *is a length that can grow or shrink,* ϕ *is an angle that can rotate.* We imagine vectorial movement like that of a variable length hand of a clock. This geometric explication of *complex numbers* prepares us to visualize *complex numbered eigenvalue* solutions to matrices representing the relevant equations that bifurcate to limit cycles and directional good and evil splitting. ρ represents the dilatable clock's radial amplitude of circular motion and ϕ, the angle of vectorial turning from the *0a-axis.*

The *complex conjugate* of the complex number, $a + bi$ is the complex number $a - bi$ in which the sign of the imaginary part is reversed. Geometrically, this means that a pair of complex conjugate numbers with the ρ's of both having below zero values relative to the *0a-axis,* that is *negative real parts*, could be imagined as the points indicated by two same sized, mirror image, clock hands pointing at 8:00 and 10:00 o'clock. Note that the ϕ, the angle of vectorial deviation of the arrow pair from the *0a-axis,* turn in opposite directions in these mirror image moving clock hand vectors. Without going deeper into the representation of the actions of the system in

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question (its differential equation) in the form of what is called its *Jacobian matrix of partial derivatives* (a matrix representation of the differential equation indicating orthogonal directional velocities of change of locations of the components of the motion with respect to changing values of the control parameter), we know that when the ρ of the matrix's set of two *complex conjugate eigenvalues* is less than zero, $\rho < 0$, the orbit representing the system, spirals into a *stable fixed point*. This is analogous to going to the *bottom of the parabolic attractor basin* as described above. *Values of the invisible eigenvalues and their changes constitute the abstract mathematical mechanisms underlying the observable dynamics of the system observable physically.*

The mathematical mechanism underlying the *Hopf bifurcation* of *fixed points* into *limit cycles* (associated with bi-directional splitting that accompanies the *amphetamine transformation* into limit cycle stereotypy of rigid ideas and equally likely mirror image motions in the directions of good versus evil) is the crossing of the systems real valued parts, ρ's, of its *complex conjugate eigenvalues* into positive territory, $\rho > 0$. The mirror image of clock arrows is transformed from 8:00 and 10:00 o'clock to the clock locations of 4:00 and 2:00. *At a Hopf bifurcation, a pair of complex conjugate eigenvalues crosses the imaginary (vertical) axis such that is real parts have positive value.* In the orbit representing the motions of the system itself, the fixed point disappears to be replaced by the action spiraling out to an *invariant circle*. This is analogous to our *manifold* image of the disappearance of the central attractive point and the sudden appearance of a small hill at the bottom of a *parabolic basic of attraction.*. The new attractor is an invariant circular path around the hill, with the *spiraling out to the invariant circle* being a two dimensional picture of the disappearance of the bowl-bottom and appearance of a missing point, hill top fixed point and a spiral flow to the path circling the hill. *Underlying the transition from a fixed point to a limit cycling, invariant circle, are a pair of mirror image complex conjugate eigenvalues that turn in mirror image, we could say, good versus evil, opposite directions. The Hopf bifurcating system inevitably has both.*

The implications of this *very abstract metaphor for the emergent limit cycle-splitting style* of spiritual transformation can be made deeper by considering the

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common practice of Rumi's Mevlevi (and other) orders of Islamic Dervishes that facilitate the onset and maintenance of their ecstatic states by an improvisational dance which goes from rocking to irregular whirling. The Dervish teaching tales place a symbolic emphasis on the power of the rotating wheel, the circling of the heavenly bodies, the mill wheel and the millstone. As Rumi said, "The mountain of the sun I'll fashion to a mill. And as my waters run, I'll turn thee *at my will.*" Note that their work toward spiritual transformation results in neither the emergence of the involuntary and rigid limit cycles of invariant circles or the associated divisive internal eigensplitting of good self from evil other. The *Sufi compass points to an integrated field of divine consciousness, which contains the appearance of the world's multiplicity. In this profound unity, all humankind is perceived as one family.* The singular direction of all prayer, Salat, five times a day, at dawn, high noon, afternoon, sunset and an hour after sunset, turns the entire world into a unified directional field of prayer. At its center, the Islamic pilgrims wander round and round the black cube of the *ancient shrine of Kaaba*,

This leaves one with the speculation that we started with: that the simple, authoritarian rules of the *amphetamine, roll-up and splitting religions* may be intrinsically more vulnerable to unpredictable breakouts into morally inconsistent actions and that the righteously rigid limit cyclists are invariantly split into ambivalence. In contrast, the more free form, *chaotic turns* of the entheogenic dervish define us all as belonging to one unified ecstatic field.

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CHAPTER 8:

FAITH AND RATIONALITY

It was my belief that, without subjective evidence of Holy Spirit Energy, the rush of reconfiguring transcendent experience, some glimmering of grace no matter how fleeting, an experience of intoxication with God, Martin Buber's self authenticating *I-Thou encounter*, the many good citizens of this world, without these moments of illumination, must be attending church or temple to negotiate a better now and hereafter. Attending synagogue or church without the promise of a mystical high seemed like a superstitious rabbit foot rubbing for personal health and safety and a sharing of propitious contacts for social and economic advantage. Why else?

I have had the good feel of what Jews call *Tzedakah*, the sharing of supplies by the haves for the betterment of the have nots. I have known the quiet calm of human right action as in the Unitarian Universalist's serving the needy, open and flexible, intimate mindfulness of others and their needs. Considering *E.O. Wilson's* brand of brain herd biology of *altruism* gives me a warm feeling about the potentially intrinsic goodness of man. But compared with the *Jamesian brands of ecstatic transcendence*, minds blown in Sufi twirling, Orthodox Jewish chanting, rocking and dancing, hands-in-the-air praying and hands-on-the-head healings of Wednesday night Pentecostal services, the soberly serious social engagement and

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responsibility sermons of Reformed Judaism and the Unitarians as well as the 19th Century hymns and high I.Q. apologetics of some Presbyterian and Methodist clergy, are like near beer. Formally equivalent but without the rush and the delicious risk and promise of life long addiction.

National opinion polls have found my preference for churchly fireworks in religious experience quite common. My Charismatic Christian sons are among the many with a preference for and loving labeling of these kinds of houses of worship as rock and roll churches. In a recent survey of Americans, 46% of respondents claim to be twice born, Evangelical Christians. Perhaps unfortunate with respect to their children's academic and professional ambitions, 48% do not accept a Darwinian view of biology. Fifty million American readers are now buying books with plots taken from the *Babylonian prophecies* and anticipate the *Rapture of Ret*urn with weekly, joyful, mini-rehearsals. They include praying in tongues as the Spirit moves them like Peter, John, James and the rest of the one hundred and twenty in the upper room on the day of Pentecost.

Those of us with two or more available cable religious networks can, on any given Sunday morning, choose a smiling, kind, Proverbs quoting, rational Presbyterian liturgical stylist. In his seventies, standing tall with a full head of white hair and in a quietly resonant voice, he delivers a sermon about seven ways to avoid growing old. His list includes learning new things and continuing to work. His spiritual proposal was about personal faith, always leaning on the Lord. On another network, the three hundred pound, restlessly pacing preacher of the Cornerstone Assembly of God Church of San Antonio, Texas, stood in front of large maps of Iraq and the Middle East. He preached from Ezekiel about the refleshing of dry bones and a return of all Jews to Israel. He said that contributions to his church over the past year helped finance the return of 4000 Russian Jews to Israel. He reiterated the promise that, when the return was completed, there would be a massive Islamic attack on Jerusalem and "we will all rise up to Heaven" in an ecstatic disappearance. Jews, as long as they accepted Jesus as their Savior, were welcomed along on the ride. More then two thousand parishioners erupted into loud applause along with shouts of "praise Jesus."

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An inkling of something entirely different, neither human psychology nor frenzy, was an unanticipated benefit of being at England's Warwick University in sabbatical residence in Math House #2. This large, round, many windows and black boards, study with a small upstairs bedroom was one of the apartments for visiting professors behind the Warwick Mathematics Institute in the English Midlands. I attended a variety of churches and synagogues on the weekends. The perspective that emerged for me at Warwick was that rabbinic *Haggadah*, inferences to be drawn from imaginatively spawned narrative, isn't the same thing as *Halakhah*, the law dictated by Jewish legal tradition; that geometric insight and other intuitions aren't the same as mathematical proofs; that the mystical visions of the English romantic poet and illustrator, William Blake, were not necessarily consistent with the scientific observations and logical arguments of the contemporary Scottish philosopher, David Hume. Paul Tillich wrote that the wisdom attendant to primary spiritual experience that was without the unconditional character of sensible moral obligation was not to be trusted without critical analyses. I learned that among High Episcopal and Reformed Jewish English academics, God is not a hallucinogen, but more like a spiritually based, social contract.

In his 1929 essay, *Mysticism and Logic,* Bertrand Russell noted mysticism's preference for: (a) Insight over discursive analytic knowledge; (b) Belief in the unity of all things over oppositions or divisions in representational thought; (c) The denial of the reality of time, even in the divisions of past, present and future; (d) Belief that evil is unreal, manufactured by the innate divisiveness in some analytic intellects. In modern brain hemispheric and other neuropsychological philosophies, these countervailing descriptions of external observables can grow naturally out of the brain's abilities to *maintain logically incompatible perspectives simultaneously*. *Right-brain aesthetic holism* in contrast with *left-brain categorical analytics* recalls a popular example. Would one chose Blake or Hume to better explain how the time dimensions of memory disappear with the scent of a past lover or the hearing of his favorite music for lovemaking.

In the inevitable mix of primitive instinct with high purpose, the visiting professors' Math House #2 had an aura of infamy. It was the one in which, by the

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accidental intrusion of a campus security officer, the brilliantly eccentric Northern California mathematician, Ralph Abraham, was famously arrested for pot smoking. The campus officer told me that, late one night, thinking he had smelled fire, he used his master key to make an unwelcome entrance. The incident became part of the record in House of Commons hearings about the intellectual and moral decay of English Universities. Apparently, even among English intellectuals, there were trivial and politicized definitions of virtue.

Christopher Zeeman, the head of the Mathematics Institute was a world-class topologist who, among other things, demonstrated biological and social-psychological applications of Rene Thom's *Catastrophe Theory*. I was invited as a brain person and amateur mathematician, to see what might result from mixing me with members of his fine mathematics faculty. In addition to learning some bifurcation and lots of ergodic (statistical) theory, my chats with Christian and Jewish mathematicians on Saturday and Sunday morning visits to the synagogues and chapels of Oxford and Cambridge introduced me to an English intellectual's religious tradition. The spirit of C.S. Lewis was still very much alive. Surprising, however, was that more than a few of these scholars had the elements of Christian faith in full menu: virgin birth, incarnation, crucifixion, resurrection, original sin and the promise of salvation. I was disabused of my belief that these elements of Christian belief were incompatible with high mental capacity and intellectual sophistication.

Yet, the spiritual climate of these English intellectual Christians were different from today's post, post Vietnam return of the religious themes of the turn of the Twentieth Century, *big tent revivalism* and Billy Sunday's brand of *Christian patriotic America*. Today's religious patriotism infuses George W. Bush's Republican base, National Security Adviser Condoleezza Rice's after dinner hymns and Attorney General John Ashcroft's early morning bible study groups for his Assistant Attorney Generals. Even the most religious of my English math buddies are without what seems like adventitious baggage of today's faith based Republicans: the belief in the immorality and godlessness of teaching evolution in schools, what has been called the massacre of the innocents in stem cell research and abortion clinics, the

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right to bear machine guns and the intrinsically venal sinfulness of a man's commitment in love of another man. Was the clustering of these apparently diverse concerns the accidental result of a sociopolitical-religious short circuit, a class-resentment-driven spiritual split in geographic, socioeconomic and educational class? Tim LeHay is selling millions of books, whole tables full at Wal-Mart's, which come packaged with these assumptions.

Surely higher-level theists would make today's evil more subtle, abstract and pervasive, perhaps involving inner life themes of envy, vengeance and aggression; goodness implicating empathically made moral choices involving interpersonal kindness and evidence of caring about the well being of others. My contact with some English academicians taught me that even the mathematics of hard science can be viewed as a gift of grace and belief in the possibility of a continually emerging, Christ-centered, evolutionary process. Protestant philosopher mathematician Alfred North Whitehead in his 1926 *Religion in the Making*, Catholic anthropologist priest, Pierre Teilhard de Chardin in his *The Phenomenon of Man* and the more modern *process theologists* of New York's Union Theological Seminary do not exclude Christ's involvement in evolving science and other new knowledge. They see Him participating in a spiritual evolutionary progress which does not gather the barnacles of irrational ideas about the murder of less than hundred-cell blastula or the psychoneurohormonally determined sexual partner preference. They know about the ever-changing cultural and political appearances of faux and real evil. Nonetheless, what I learned from my Christian and Jewish friends at the mathematics institute was that, though the definitions of evil may change, evil as a construct and spiritual mechanism is an apparently essential component of the Christian experience. On Rosh Hashanah, even the reformed Jews commit themselves to *Teshuvah*, making up for past evil deeds. The good versus evil dichotomous view of man's existence is true in the lives of Assembly of God Fundamentalists of Georgia as well as the sophisticated Readers, Professors and Dons of the high Episcopal churches and university chapels of Oxford and Cambridge.

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Finding high-level mathematical thinkers at home in metaphysical surrounds and metaphysicians diligently practicing mathematics are certainly not new. Some instructive examples include, famously, the Pythagoreans, the 15th Century Catholic Cardinal Nicholas Von Cusa, who used geometric symbols to record his spiritual philosophy, and the Talmudic-Cartesian style of argumentation of Nicholas de Spinoza. This approach to an examination of metaphysical systems, sometimes called *mathematicism*, exploits the machinery of the mathematical mind to evaluate the consistency and completeness of thoughts, to create *representative axiomatic structures* and to operate within them using *syntactic calculus*. The practice of the rational dialectic of mathematicism, working for moral purity of heart, develops a brain-somatic discipline much like the exercises of Yoga.

This approach flies in the face of the major premise of these essays, my belief in the necessity of what William James and others have called the *primary religious experience* in order to know God. Recall that my father's favorite Jewish mystic, Abraham Abulafia, said this experience gives birth to an *activated mind* that can then immediately and completely inform the Spirit. Among the religious English mathematicians, I learned that it doesn't have to happen this way. One can apparently think oneself to It. A well known example of a modern theistic Oxford type, the Magdalene College English tutor and Don, C.S. Lewis, in his introduction to St. Athanasius's *The Incarnation of the Word of God,* wrote, "...I believe that many who find that nothing happens when they sit down or kneel down with a book of devotion, might find that their heart would sing unbidden while they are working their way through a tough bit of theology with a pipe in their teeth and a pencil in their hand..." In contrast, without my personal experiences with joyful transcendence, the direct feeling of His presence, I would not have known about the goals of his more analytic efforts. It was a struggle for me to use a rational mind to share the meanings of the poetic ruminations in his BBC lectures, *Mere Christianity.* This Reader from Oxford with two firsts in Latin and Greek followed by another first in English Literature, described the world as "...enemy occupied territory..." the omnipresence of the Good Power turned Dark Power of the Prince of Darkness and the Christian as "...a man who is enabled to repent and pick himself up..."

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For C.S. Lewis, religious faith came from intellectual hard work. He was put off by spirituality that arrived by thoughtless fiat. He rejected the idea of living in simple and loving direct conversation with the God within, as described by Brother Lawrence. Lawrence was described as the simple "great awkward fellow who broke everything." Lewis had little faith in what he perceived as the mindless spiritual methodology of this selfless, silent, hard working Parisian monastery cook for a hundred fellow monks who was also their dedicated smelly sandal repairer. Perhaps reflecting his place in the British intellectual class system, Lewis wrote that Lawrence's conversations and letters in the brief pamphlet, *Practice of the Presence of God*, "...full of truth... but unctuous and repulsive." At the same time, Lewis spoke of his own experiential evidence for God in *Surprised by Joy* in which he admits, "I am an empirical theist. I have arrived at God by induction." It is likely that Brother Lawrence did not know and did not need to know the difference between an inductive and deductive argument.

For most of my years, I have been a subject of Jamesian transcendent experience, LSD expansive visions, Sufi moving meditation, long distance running, Black Baptist shouting, Tantric orgasmic withholding, Yiddish Labovicher dancing, Charismatic Christian Church rock and rolling, Hindi meditative rising Kundalini, almost any ecstatic crisis inducing, God type. Recall that I am from a generation that a Donovan song inspired to smoke bananas. I did not personally access Brother Lawrence's calm, work-a-day, devotional, quietly persistent, perspective yielding, inner conversations with God until my sixth decade. The opportunity came from my growingly severe, unfixably chronic, pain. The counter-intuitive insight and helpful identification was gained from reading about Joseph de Beaufort's conversations with Brother Lawrence. Beaufort said Lawrence was born with the name Nicholas Herman in 1611 and renamed Lawrence in honor of his parish priest. As young soldier in the Thirty Years War of the 17th Century, he was severely injured. He was left with both sciatic nerves trapped between bone spurs and tissue scarring from his early twenties. These injuries, involving the two biggest pain-conducting nerves in the body, left him crippled in gait and in chronically severe lower back and leg pain from which he would never be free. It was after this time

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and a few years of looking for God in what he called "wondering in the wilderness" that he began his 40 years of monastery service as cook and sandal maker. He was described as amazingly selfless and a "...gentle man of joyful spirit..." who "...continually walked with God...not from the head but from the heart..." Doing long hours of selfless work with such painful disabilities, how was it that he maintained his joyful, loving and calm contact with God and his fellow man? How did he do it? I found that, as with all miracles of God contact for me, it happened by itself.

I suffered my first testicular cancer in my thirties. I felt the little hard rock by accident while scratching. It was on the left side. Surgical removal was followed by a five-hour radical abdominal lymph node dissection that left me with incidental abdominal sympathetic nerve damage, urinary hesitancy and ejaculating backwards into my bladder. The tissue diagnosis was of embryonic cell carcinoma with chorionic elements. The U.S. Armed Service Pathology Department's statistical book gave me 5% chance of living beyond two years. My second testicular cancer occurred in my fifties and on the right, two little joined lumps found by my wife. It was a seminoma with cure rate of 85% but requiring four weeks of almost daily x-ray treatment. The combination of radiation induced blood vessel scarring (they had to blast widely since my earlier lymph node dissection confused the usual radiological anatomy), a pre-existing laterally curved spinal column and the arthritic changes resulting from fifteen years of running over 10 miles per day with this kind of back led eventually to the degeneration and collapse of several of the bodies of my vertebrate pinching several leg nerves between bone spurs and radiation-induced scarring. I have been in increasingly severe back and leg pain for fifteen years.

It was in this way that I fell heir to both Brother Lawrence pain syndrome and what I now think was his strong inclination to live in the Spirit, as far as possible outside the concerns with his own mental and physical body. In my experience, this led naturally to a decreased in my life long narcissistic preoccupations, diminished my ego-driven achievement desperation, setting up a more comfortable inner seating for conversations about and with God. The choice was between fully embracing a God-oriented place for most of my daily existence or the chronic use of

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enough narcotics to eliminate complexity of thought, real interpersonal feelings and hope for meaningfully creative work. The remarkable thing to me was that people began to talk about my "improved disposition," an increase in out-of-my-psychiatrist's office personal empathy and kindness as well as a significant decrement in my overweening, ego-stoking ambitious and competitive urges. Any return to the earth body of tense readiness to competitively succeed, protect with ego defensive anger, fantasies of assertive sexuality, stand tall grandiose notions of intellectual superiority, even getting up for scientific combat, was accompanied by the return to this world of pain. Only lovingly detached, unpretentious, other directed, quietly calm inner dialogue with Him was a place that I could live. This was an inner land of still another kind of God than I had previously known. I could even read and struggle with theological ideas thoughtfully, without referencing personal mystical, psychopharmacological, Holy Ghost-mimetic, experiences. I could enjoy the rational, social responsibility valuing, spiritual peace of a white Protestant Sunday morning service. I could attend Reformed Jewish Friday night services about man's responsibility to man without restless boredom. No longer seeking the feeling of God's thrill, I could think about it, even without being in the state of my father's and Abulafia's *activated mind*.

If I had been benefited with a classical language education beyond the high school and early college Latin of Julius Caeser and Cicero or matriculated in an academic theological seminary, I would have already studied, maybe even worn out, the deeper aspects of what seemed like a paradox of the *consonance of faith and reason*. I would have been familiar with the rhetorical argumentation in the patristic Latin commentary on sacred texts by Tertullian and other Fathers of the early Christian Church, the Talmudic discussions (the Mishna in Hebrew and Gemora in Aramaic) of the oral Torah by the Rabbinate, the Muslim explication of Koranic Islam in the oral tradition of the Hadith. Robert Wilken in his recent *The Spirit of Early Christian Thought* was in no doubt about the harmonic relationship between rationality and faith: "...by putting itself in the service of truth, faith enables reason to exercise its power in realms to which it would otherwise have no

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access..." It is perhaps strange to come to this common knowledge so late, but I came to my life with my forbearers and father's magical, mystical biases.

My father had parodied what he thought was the "wasteful time" spent in rational, Talmudic discussion. He said that is what Jewish men spent their time doing to avoid physical work while sitting near the city gates. It was the women who raised the crops and cared for the cattle and children. He had a favorite conundrum satirizing the village gate discussions. Jewish males, after the age of thirteen, accompany their morning prayer of commitment to loving and serving God with the ritual of wrapping scripture embedded animal skin, *tefillin,* and winding them seven times around the left arm, near the heart, and around the head, symbolizing the mind. This contextualizes how my father made fun of a typical topic of these all male Talmudic seminars: "If one had seven arms, would one wrap the *tefillin* once around each appendage or seven times about one of them. If the latter is the case, how would one chose which one." In fact, there remains an on-going debate about the order with which the embedded four passages from Exodus and Deuteronomy should be arranged and inserted in the *tefillin* such that some compromising orthodox Jews wear two types of *tefillin,* each representing one of the theoretically justified orderings. I know now that there is an implicitly positive confirmation of a jointly held faith and feeling of ethnic belonging achieved by such apparently abstract discourse and argumentation.

In truth, I had not come to Warwick to explore the relationships between faith and rationality using the cognitive style of mathematicism, but rather to be saved by the mathematical miracles of the Brain God. Not unrelated to what C.S. Lewis saw as a prominent characteristic of spiritual experience, "wonder," and what Philip Davis and Reuben Hersh in their 1981 book, *The Mathematical Experience*, spoke of as "beauty" and "surprise." I know about the attack of excitement that comes with the sudden emergence of counterintuitive conceptual connections while exploring new mathematical ideas. In energetic high, I start skip reading, underlining the book frantically, jotting commentary on the margins, copying the relevant equations into my notebook. Was this the same break through to a glimmering of grace, everything beautifully in order and precious, that I experienced on LSD while sitting for hours

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inside Paris's towering, echoing, Notre Dame Cathedral, hearing Latin chants in the dank sweet smell of old church and chained, swinging canisters of smoking incense as the pipe organ roared? Those realities that George Berkeley, the 1721 author of *Treatise Concerning the Principles of Human Knowledge,* the theist whose name was given to a mostly agnostic Northern California city, saw as grounded in the spirituality of God's infinite mind and broadcast as universal ideas through our derivative, finite minds. Rational religion and mystical religion joined in faith by the presence of implicit and universal mathematical structure

I spent about two years at a mathematics institute in France, *Institute des Hautes Etudes, IHES,* sitting at the guru feet of the mathematical great and metaphysician, Rene Thom. His mathematical pallet was breathtakingly broad, a taste of what in past centuries was called *natural philosophy* and what seemed to me to be about the unapologetic geometrization of the Intuitive God of the Mind. Natalie Angiers, erstwhile mathematician, now reporter and atheistic hard ass, writing in the New York Times, called Thom's ideas the talk of "...an Emperor without clothes..." The Kantian theme of the personal *a priori* status of an intuitive geometry, an already in us representation of all that's out there, was implicit in his *Catastrophe Theory* research program and was published first in his classical *Structural Stability of Morphogenesis* (1977) and made more overt in his later (1990) *Semiophysics.*

To get a feeling for the rational-logical versus mystical-intuitive spiritual issue in a mathematical context, consider the following: most of us remember the struggle to unify the strange and difficult cognitive duality of the high school geometry experience. On one hand, shapes and their relations and rearrangements could be intuitively grasped, even manipulated; on the other hand, we were taught that these mental images and the results of their intuitive transformations were not to be trusted.

In mathematics, as in my belief in the fireworks of primary religious experience, seeing is not necessarily believing. In my high school geometry class, what was to be believed was what followed from the proper practice of the tightly organized, Euclidean system of axioms, postulates and the derivative logical

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operations resulting in the surety of proofs. The unresolved tension about what I believed from intuitive experience and what I was allowed to believe from the logic of theorem and proof, perhaps not unlike my belief in the transcendent experience over logical theological argument as Reality, continued throughout my life. For example, many decades later at *IHES,* I saw the world class dynamical systems theorist and differential geometer-topologist, Dennis Sullivan, use a projector to display a computer-generated, intricate and beautiful, mathematical object, the well known, computer screen saver, *Mandelbrot set*. It represents the control parameter plane of the well studied *complex analytic map,* $z \rightarrow z^2 + c$. Sullivan, pointing to a small, discrete complicated little part of it that looked like a little version of the whole of it, from a distance looking like a point, said, "An important Ph.D. dissertation is waiting to be done on the question: is this (pointing to the little object) really there?" In the audience of about a hundred professional mathematicians and one amateur, I was the only one that laughed.

Historians of mathematics point to the successful generalization of Euclidian geometry via its abstract axioms, postulates and logical operations to a new, not naturally intuitable, almost nonvisualizable, *non-Euclidean geometry* (with the new geometric axiom, *parallel lines do meet at infinity*), as evidence against the Kantian idea of the intuitively accessible, *a priori* status of geometry. This served as an example of where mathematics naturally resides, and argues in favor of the thought control imposed by the modern set theoretic and logical rituals of mathematical theorem and proof. Thom, in a hereditary-evolutionary biological argument developed in *Semiophysics*, said "Objections raised to the Kantian apriority of Euclidean geometry after the discovery of non-Euclidean geometries, and the theories of twentieth century physics (restricted and general relativity, quantum mechanics) appear to me to be irrelevant…they deal with …the infinitely small and infinitely large…which lies outside the usual cognitive activity of ancient man."

In my discussions with him, Thom found equivalence relations between mental and real world objects and their behaviors. He described what he called an abstract *physicalist* truth that describes a *psychic universe*, which, in turn, simulates outside things and processes. Much like the transcendent experiential God I have

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experienced, seek and think I know about, Thom was not after the logical proofs of geometry but rather viewed mathematical theorem and proof work as activity *derived* from intuitive experience with geometric relations as the thought forms that represented *real Reality*. Though a Field's Medal winner in mathematics (recall that it is the Nobel Prize in mathematics awarded every four years at the International Congress of Mathematics) and for his life time, one of the most brilliant and fecund mathematicians in the world, so many mathematicians admit that they got the seeds of their life work from his throw away remarks, Thom, with a little smile and his eyes twinkling, admitted to me with apparent pleasure that "I have never proven any theorem in my life." All his discoveries came from insightful moments of grace and the courage to pursue them. Riding back from Paris late one night on a train that didn't stop at *IHES's* town of *Bures sur Y'vette,* I watched him use the red emergency phone to call the train's engineer to stop the train suddenly for our exit. I loved him, in part, because he had the courage to believe in and act on my kind of intuitively realizable, experiential God.

In keeping with his characteristic style of generalizing mathematical systems beyond their carefully defined specifics, Thom defined the concept of *singularity* very broadly, speaking of them as distinctive and noteworthy things, points *where the usual or expected properties, laws and definitions fail, where smooth and continuous processes become discontinuous.* For Thom, these were the *settings for the unexpected and miraculous*. He believed that his work and that of many others, now and in the future, would indicate that the *set of miraculous singularities were finite*, *systematic, universal and describable*. Most importantly for our purposes, Thom believed them to be *archetypal. It was through the structure of archetypal singularities that he regarded inside and outside realities as mutually reflective*.

I was blessed by hours of discussion with him during his car travels to lecture around France. Thom often asked me to accompany him as he drove from *IHES* to various branches of the University of Paris. He used these times to exercise my geometrically flavored, mathematical intuitions. He used words to create visualizable structures without the diagrammatic aid of a blackboard. He used mental topological structures created by the properties of imagined motions,

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flows, which led to examples of some of his universal singularities that he claimed could be found in all real physical, biological and psychological systems. For some examples: One of his archetypal singularities was a *boundary* at $x = 0$ such that the *flow* couldn't spread from where it was in $x \geq 0$ into $x < 0$ and was therefore like the border, the membrane, between the inside and outside of a cell as well as the hoped for sociopolitical functions of the Great Wall of China and the Maginot Line. If we were to blow up the boundary line from two to three dimensions, $R^2 \rightarrow R^3$, the straight boundary line becomes a *cylinder* for directionally organizing and connecting flows as in blood vessels, oil pipes, cables and wires. Since production and delivery need not occur at similar rates, temporary storage is required and may take the form of a spherical blow-up in the vertical segment of R^3 leading to an open *bottle* which may serve as a dead end storage branch of a network of connected cylinders. In the conceptual reductionism of *Semiophysics,* Thom said, "...life is essentially a question of embankment, canalization and the struggle to stem dispersion." These structures of mind and world are built and maintained. Coagulation of blood is an example of a canalized fluid repairing gaps like a tubeless tire. Thom considered apparent the problem of *making something from nothing*, *birth*, that of finding the *hidden sources*: the bubbling spring emerges from an unseen, underground network of canalized fluid flow converging on the apparent source, birth being the invisible becoming visible. In contrast, a canalized flow emptying into lake can represent disappearance as a flow.

Mathematicians from all over the world attended Thom's 65th birthday celebration at *IHES.* His Field's Medal winning work on the topology of *differentiable* (*smooth*) *manifolds*, *cobordism* and related ideas, was mentioned frequently, and great homage paid to him with respect to these areas of his work. However, in two days of lectures of personal and professional tribute by the world's great mathematicians, his work relevant to *Catastrophe Theory* and *Semiophysic*s was not mentioned, even once. The form taken by mathematicians' most severe judgments is silence. As the New York Times' Natalie Angier's comments indicated, this is not the time for the intuitive conduct of applied mathematics.

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It was upon Thom's recommendation, that I spent the year in the Mathematics Institute in Warwick, England. Using the Math House #2 s home base, I made many trips to Oxford University and a few to Cambridge. It was in these places that I learned first hand that belief in the Resurrection was not simply a matter of socioeconomic class. I tried to schedule my trips to Oxford or Cambridge to coincide with the weekend so I could hear the remarkably literate sermons at the Universities college chapels. In these places, for hundreds of years, just because one was a top-notch practitioner of mathematics or linguistics did not mean that the Don did not have within him the full panoply of beliefs attendant to the Christian God.

Maybe this easy combination of logic and Spirit derives from the character of English mathematics. There are graduates with professorially enfranchising Masters of Art Degrees in Mathematics from Cambridge University where the subject is considered by many to be part of the culture of the humanities, closely akin to philosophy and linguistics.. In the universities of United States, for example the Massachusetts Institute of Technology, an academic degree of Ph.D. in mathematics is seen by most faculty as an indication of the intellectual equipment required for a life of scientific work in which disconfirmable experiments are the ultimate criteria for knowledge. The field of pure mathematics (not ostensibly relevant to the real world outside the mind) has itself evolved in this direction. Recently, a physical scientist, a theoretical physicist, Edward Witten, was given the mathematician's ultimate award, the Field's Medal. In American universities in general, very few mathematics departments are in schools of the humanities. Most are in the schools of science. This variation in bureaucratic, metaphysical, sorting reflects our continuing struggle with the true nature of reality and the role of mathematics in its knowing. The now emergent field of computer science removes mathematics even further from intuition and Spirit. Difficult problems such as proofs of theorems can be systematically examined for all possibilities quickly by trying them out in what is now known as a *computational proof.* On the other hand, pointing at this computation's graphics, the theorem and proof, real mathematicians can ask, is *this really there*?

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Mentioned briefly above was one of humankind's beacons, Pythagoras, the intellectual and spiritual progenitor of Plato. He taught the disciples of the *Pythagorean Brotherhood* in Crotona, Italy, that reality at its deepest level was mathematical thought. Studies there included philosophy, geometry, music and astronomy, all at the service of achieving closer union with the Divine. Pythagoras and his school, only his student's writings remain, was said to be working at unifying elements of the ancient tribal mystery cults with the observables of worldly events through meditative, mathematical, philosophical mysticism. Knowledge was gained through spiritual intuition made harmonious with formal systems of thought. As Plato later said and as quoted by Thomas Heath in his 1921 *History of Greek Mathematics,* about the study of the motion of stars, "...leave the heavens alone..." because what one sees is only an approximation of the real and more perfect mathematical structures involving *points, lines and circles*. To which Newton added an *elongated circle, the ellipse*, and Nineteenth and Twentieth Century mathematicians and physicists, the *geometries of positively and negatively curved space.*

It is perhaps not an accident that debates about evidence for the existence and location of God and where the ideas and structures of mathematics live and breath generally involves a stand off between those that believe that both are out there and can be seen, like thoughtful, humanistic actions and caring service for needful others, versus those that feel the phenomenology of both are projections of the psychobiologically intuitive Brain God and can be felt like an ecstatic rush of insightful illumination.

Further Reading for Faith And Rationality

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APPENDIX

AN INTUITIVE GUIDE TO THE IDEAS AND METHODS OF DYNAMICAL SYSTEMS FOR THE LIFE SCIENCES

Arnold J. Mandell and Karen A. Selz

Biological Scientists Can Understand and Use Ideas and Methods of Nonlinear Science

A yield of advances in computer hardware and software is that even quite difficult applied nonlinear mathematics can become accessible to experimentally oriented biological scientists. Before this time, the development and analysis of a particular set of nonlinear differential equations, describing the actions of a neurobiological system in motion, involved decades of specialty training, rare insight and many hours of highly skilled, trial and error computations by hand. Since the idiosyncrasies of each nonlinear system were considered unique, the results of their analyses were thought to concern only the particular nonlinear system being studied. Often a shift in hypothetical mechanism meant starting the long and painful process all over again. In addition, these findings were usually communicated only to a small and arcane mathematical community in the form of dense theorems and difficult to follow proofs, insurmountable language barriers to biological researchers wishing to use them to better describe and understand their experimental observations.

For today's neuroscientist with a desktop computer, an inclination to program and access to computer algebra and numerical software such as Maple, Mathematica or MatLab, operational definitions and computational empiricism can replace the theorem and proof continuity required to do old style applied mathematics. For those of us without sufficient facility in algebraic manipulation to easily follow the arguments of professional mathematicians, a computer algebra program such as Maple serves as a delightfully accessible consultant with which to "check out what the guy is saying". Those motivated enough to write their own data generating or analytic programs in C, Fortran, Pascal or Basic (though not

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essential) can find easy-to-use algorithmic help in Cambridge University Press's Numerical Recipes series (Press et al, 1991).

The conceptual and communication gaps between applied mathematicians and physicists and the bench practitioners of the neurosciences, that inevitably lead one or the other, most often both, to surrender their deepest intuitions to jointly shared images that are inevitably more simplistic, are no longer inevitable. With her own hands on both the quantitative conjectural and experimental machinery, the motivated practicing neuroscientist can honor her own insights, read about and construct symbolic representations from her intuitions and do her own quantitative theory. Computerized numerical techniques have become so powerful and accessible that, even in academic settings, there is debate about whether fundamental analytic tools, such as series expansions, should be taught in undergraduate courses about differential equations.

The practice of "try it and see what happens", with the current name of experimental, computational mathematics, is accessible to all. In addition to the powerful general mathematical programs noted above, there exist several sets of more specifically targeted software with the capacity to generate, portray and quantify the behavior of nonlinear continuous and discrete abstract and real dynamical systems. These often also include algorithmic modules that are useful in tailoring new models and measures (see for examples, Parker and Chua, 1989; Baker and Gollub, 1991; Nusse and Yorke, 1991; Sprott and Rowlands, 1991; Sprott, 1993; Korsch and Jodl, 1994; Enns and McGuire, 1997). Learning from and using this software, along with only a little programming in the high level languages and computer algebra programs listed above, permit the non-mathematician neuroscientist, willing to read in the literature such as that described below, to do independent, cutting edge research in applied dynamical systems.

Described below will be the computational discoveries in abstract systems and real neuroscientific data that have led to multiple contexts of quantitative description. These include those that are: (1) Geometric and conserve metric distances; (2) Topological and conserve relative positions but not distances; (3) Single or multiple global quantitative descriptors such as scaling numbers or scaling

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number spectra; (4) Non-Gaussian distributions with heavy tails and correlations reflected in their Hurst, Fano, Allan and Levy exponents; (5) Statistical dynamical descriptions of trajectories of the system in their embedding space such as Lyapounov exponents, Hausdorff-Mandelbrot dimensions, Sinai-Ruelle-Bowen measures, and Adler-Weiss-Ornstein topological and metric entropies.

Characteristics which discriminate between experimental versus control conditions in parametric computational and real physiological and pharmacological experiments serve to generate and test ideas and imagery arising out of behavior observed in both biological and abstract dynamical realms. New experiments can be suggested by the implicative structure of dynamical systems theory as well as neurobiological findings and intuitions. As examples, the sudden "switch" of manic-depressive bipolarity syndromes may be a "bifurcation" in nonlinear dynamical systems; the "noise" of the statistical physicist may be the "arousal" of the brain stem-thalamic biogenic amine and reticular formation neurophysiologist; aspects of "thought disorder" in the pathophysiology of schizophrenic patients may be an entropic sequencing idiosyncrasy in the "symbolic dynamics" of a particular brain system attractor; neuronal "bursting" may be the "intermittency" of a neurodynamical system; a multiplicity of "discrete ion channel conductances" may be a single "global scaling hierarchy" of conductances times. The number of published examples of this fusion of ideas and methodology in the biological-relevant literature is already in the several hundreds and Medline counts indicate is growing exponentially. Representative samples of these are described below.

In addition to the technological advances in computational hardware and software, the major scientific surprise making this new era possible is the discovery of universalities, the finite set of behaviors characteristic of most, if not all nonlinear systems, across most if not all of the specific equations or neural systems being explored. This makes the emergence of semi-quantitative equivalence relations between model and data not only possible but likely, even though we don't now and perhaps never will know enough to either write or solve completely the specific and detailed equations for the biological system of interest. We neuroscientists need not be apologetic for using these ideas and tools qualitatively and empirically. In fact,

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unanticipated results of analog and digital computer experiments were responsible for most if not all of the discoveries underlying the current era's revolution in applied nonlinear mathematics

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Modern Applied Dynamical Systems Emerged from Accidental Computational Discoveries

A medical student named Herr, in his thesis research with the "radio engineer", Van der Pol (1926), was simulating cardiac electrophysiology with an analog device which permitted real time, exploration of a full range of parameter values long before there were fast enough digital processors to do so. Studying the behavior of equations of a periodically, pace maker, driven, nonlinear triode oscillator, Herr found orbital points that appeared to belong to two different periods simultaneously thus violating the uniqueness of solutions of differential equation theory. The Van der Pol relaxation oscillator equations, with their slow buildup and sudden discharge of membrane potential are good models for the slow-fast processes of repolarization and depolarization of Hodgkin-Huxley type equations (Rinzel, 1985). Periodically driven, nonlinear differential equations of the Van der Pol type are generally applicable to the multiplicity of dynamical regimes of neuronal dynamics (Carpenter, 1979; Aihara et al, 1984; Chay and Rinzel, 1985) and, with periodic and aperiodic driving and noise, can be made relevant to particular mammalian neuronal subsystems in the context of clinically relevant global electrophysiological phenomena such as Magoun's (1954) brain stem evoked EEG and behavioral arousal (Nicolis, 1986; Selz and Mandell, 1992; Mandell and Selz, 1993).

In the early 1940's, using the pre-publication results of similar analog computer studies (Levinson, 1949), the Cambridge mathematicians, Mary Cartwright and Joe Littlewood (1945; McMurran, S., Tattersal, J.,1999) used geometric methods to prove that the highly nonlinear, periodically driven Van der Pol equations, depending upon one or two changing parameters, generated fixed point ("homeostatic"), periodic ("cyclic"), subharmonic ("period doubling"), quasiperiodic ("multiply periodic"), intermittent ("bursting") and "deterministically

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random" patterns. We now know such phenomena to be universal characteristics of bifurcation scenarios in nonlinear dynamical systems where bifurcation means discontinuous changes in patterns of behavior (dependent variables) resulting from smooth changes in parameters (independent variables). Alerted to their presence in computer experiments with biologically relevant nonlinear differential equations, these phenomena have since been found in time series from patch clamped membrane channels, single neurons, neuronal networks, neuroendocrine systems, brain waves and patterns of behavior in animals and man (see below). Cartwright-Littlewood found that the inner and outer edges of the domains of attraction (all the initial values that eventually wind up in the attractor—the limit set of all bounded solutions) of two different sets of subharmonic periods for the same parameter settings were interlaced at many scales in what is today called a fractal basin boundary. It was in this way that the specific values of the end state are understood to be indeterminate since the starting values in the fractal basin boundary are impossible to isolate and specify with adequate experimental precision.

Similar biologically-relevant analog computer discoveries about the Van der Pol and comparable periodically forced, dissipative (energy utilizing) Duffing equations (Zeeman, 1976) were made in the early 1960's by electrical engineer, Yoshi Ueda (1992), but his thesis director, Chihiro Hayashi of Japan's Kyoto University, was sufficiently disturbed by this evidence for the existence of bounded solutions (attractors) that were neither fixed points (equilibria) nor periodic orbits (cycles), the only ones known at the time and therefore "strange," that he refused to let Ueda publish his findings until he did so as an independent investigator in the 1970's.

In the early 1960's, Edward Lorenz (1963), a meteorologist and student of the Harvard mathematician and dynamical systems pioneer, George Birkoff (1922), was computing the output of a very reduced subset of Saltzman's differential equations for predicting the weather (1962). Lorenz found that numerically integrated trajectories manifested unpredictable times and directions of motion between the two spiral orbits of what has come to be known as the Lorenz attractor. Very small differences in starting values led to widely diverse final values, and, just

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as importantly, far apart initial values could be found close together in the limit set. This behavior was called "sensitivity to initial conditions" by David Ruelle (1978; Ruelle and Takens, 1971). It is noteworthy, however, that over a range of values of the parameters, the overall pattern of the orbits of the Lorenz attractor results in characteristic geometric pictures as well as invariant statistical descriptors. Qualitative and quantitative global similarities were gained while specific solutions were lost in these "strange attractors" of nonlinear systems. Analog computer simulation of a simpler set of equations inspired by nonlinear chemical reaction kinetics led to the discovery by Rössler (1976) of another early and generic strange attractor combining sensitivity to initial conditions and characteristic geometries and measures.

It was the Russian mathematicians, A.N. Kolmogorov (1957), Sinai (1959) and V.I. Arnold (Arnold and Avez, 1968), the French mathematicians, Rene Thom (1972) and David Ruelle (1978) and the U.C. Berkeley mathematicians, Steve Smale (1967) and his student, Rufus Bowen (1975), and their associates who gathered together these and other related computational discoveries and embedded them in a qualitative theory of nonlinear differential equations, using a variety of formalisms, including point set and differential topology, geometry, analysis and ergodic (having an invariant statistical description) measure theory that formally established the fundamentals for research in nonlinear dynamical systems. Here a dynamical system refers generally and simply to the components and nonlinear processes (transformations) that move points (values) in discrete ("map") or continuous ("differential equation") time around in an appropriately defined space. The phrase, "nonlinear transformation" in this context does not imply easily solvable curved functions, such as those representing the sigmoid kinetic or threshold functions of enzymes and neuronal networks or those that smoothly log transform the amplitudes of auditory or other sensory modalities in man, but rather allude to expressions containing products, powers and functions of the computational and/or experimental variables x_i, such as $x_1 x_2$, $(x_i)^3$ or $\sin(x)$.

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As noted above, the cross-disciplinary cohesiveness of such a vaguely defined field occurred as the result of the unanticipated discovery of a relatively small set of nonlinear phenomena, universalities, that implicated many fields of mathematics, from differential geometry to number theory, and were found in a broad range of physical and biological realizations, from turbulent plasmas and chemical and enzymatic reactions to neuroendocrine hormone release patterns. It is perhaps counter-intuitive but, whereas linear systems can generate an infinite number of solutions locating points anywhere the person writing the equations wants them to go, nonlinear systems are generally restricted to a finite set of global dynamics and these emerge on their own from the intrinsic dynamics of the system. Trying to make these systems follow orders, not unlike finding the most clinically effective dosage range of a psychopharmacological agent, require the empiricism of trial and error experiments.

A second class of computational accidents involving nonlinear systems resulted in unanticipated coherence rather than unpredictable disorder. Using one of the early "high speed" digital computers at Los Alamos, MANIC I, Enrico Fermi with Pasta and Ulam (1955) attempted to obtain a many-body statistical thermodynamic equilibrium analogous to heat generated noise by coupling 64 particles together with nonlinear springs. They found only a few low period modes that oscillated indefinitely. Instead of equidistribution of the energy into 128 degrees of freedom (64 locations $\times$ 64 velocities in 128 dimensional phase space), they found it gathered up into only few coherent modes. Although the relevance to biological science of nonlinear multifrequency coherence is a bit off from our focus, it is worthwhile noting that a recent (Karhunen-Loeve) decomposition of the alpha band of the resting alert human EEG revealed only three dominant temporal–spatial modes: anterior-posterior, rotational and standing (Friedrich et al, 1991) and "few frequency coherence" is a frontier of inquiry in brain wave research.

A heterogeneous collection of coupled nonlinear elements in the form of widely distributed, multi-location, multifrequency systems such as cross-cortical, brain stem-thalamic-cortical and interconnected spinal motor neurons can generate

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coherent activity. This temporal and phase coherence plays an important role in current theory of sensory-associative-motor integrative function, how distributed attributions come together in the brain representation of a single object or process, in the context of the so-called "binding problem" (Singer, 1993; Bressler, 1995; Nicolelis, 1995; Schiff et al, 1997). Diffusely distributed neurochemical variables have been invoked. For example, the role of metabotropic glutamate receptors in driving the synchronization of interneuronal networks has been suggested as a mechanistic model (Whittington et al, 1995). The objects of relevance to the discovery of Fermi-Pasta-Ulam are studied as the nonlinear physics of nondissapative wave processes and are called solitons (Zabusky and Kruskal, 1965). They have been invoked to model nerve conduction and information transport in brain (Scott, 1990).

A third counter-intuitive set of accidental computational findings is in an area of research called symbolic dynamics which involves the universal parameter-dependent coding language and capacity of nonlinear systems. In the early 1960's, a group around Stan Ulam at Los Alamos (Cooper, 1987) used one of the early "high powered" computers, MANIAC II, to iterate (letting the output of the action of a discrete time function serve as its input the next time around) simple equations they called "maps." These reduced dimensional objects shaped like tents, sine functions and parabolas can be extracted from and represent the behavior of higher dimensional, nonlinear differential equations (see Devaney, 1989; Schuster, 1989 or Moon, 1992 for intuitive descriptions). They varied a parameter, such as the height of the tent or parabola, to systematically change the period and/or phase (order) of the symbol sequence (Metropolis et al, 1973). Normalizing the range of values of the output to [0,1] and transforming the series of values into a binary code, $L \leq 0.5$ and $R > 0.5$, they found an invariant, one parameter dependent, progression of ordered periods, R, RLR, RLRR…RLLRL…, in all such single maximum maps. This "U (universal)sequence" has also been found as singly or multiply present in a variety of real systems, including complicated chemical reactions (Simoyi et al, 1982; Coffman et al, 1986). This means one can "dial" the parameter to generate "words" of sufficient computational complexity to serve as a language. These

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computer experimental findings had already been anticipated in a remarkable mathematical proof by Sharkovskii (1964).

The dynamical richness of these simple, single maximum, one dimensional maps was computationally explored in the context of ecological and epidemiological issues in the classical studies of Robert May (1976). It has been possible to relate the individually characteristic L, R sequence behavior of human subjects on a computer task to a unique parameter of a tent map generating those sequences which predicted age and discriminated subclinical obsessive compulsive from borderline syndromes (Selz and Mandell, 1993). The dynamical entropy of unstructured L,R behavior also discriminated a population of schizophrenic patients from normals (Paulus et al, 1996). More generally, parameter dependent dynamical coding, built into the universal behavior of its constitutive equations, is a mechanism with which a nonlinear dynamical system, such as nerve membrane equations as above, or in the aggregate, the middle layer of a completely connected neural network, can encode, Morse code-like, messages (Paulus et al, 1989).

Bifurcations in Biologically Relevant Dynamical Systems

Bifurcations, "splitting into (two) branches," are observed over a smooth change in control parameter(s) (independent variables), as a discontinuous and qualitative change in the dynamical (time-dependent) pattern of the observable (Guckenheimer and Holmes, 1993; Wiggens, 1990; see Strogatz, 1994, for a particularly intuitive description). Qualitative here means how the dynamics of the trajectory appear as a geometric-topological (relative shaped not necessarily sized) pattern in phase space. In such a space, the orbital points are located along the x-axis by their value, x at time *t*, and along the y-axis by their time rate of change at that *t*, $\frac{dx}{dt}$. To visualize a representative phase portrait in the plane, start by imagining the pattern made by mass hanging on a linear spring at rest as represented by a point centered at $x = 0, y = \frac{dx}{dt} = 0$. When perturbed from rest, the

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phase portrait of the motion of this "harmonic oscillator," is composed of a (continuous) series of points representing its location, graphed along x, its rate of motion graphed along , $y = \frac{dx}{dt}$. x and $\frac{dx}{dt}$ co-localize the circular orbit as it speeds up and slows down while it bobs up and down. The transition from a fixed point (the mass at rest) to a circle (the bobbing mass), a bifurcation in phase space, results in the loss of topological equivalence. That is, the phase space geometries before and after the bifurcation cannot be smoothly distorted into each other. Continuity and connectedness of the space is lost. For topological equivalence, stretching, bending and warping are allowed but not tearing apart and/or gluing together. Following the bifurcation of a fixed point into a circle, even limitless shrinking of the ring leaves a hole. The appearance or disappearance of an equilibrium fixed point (called a "saddle-node" bifurcation), splitting into two ("period doubling" bifurcation), its exploding into a circle ("Hopf" bifurcation to a limit cycle), a circle splitting into two or more incommensurate cycles ("secondary Hopf" bifurcation) and these multiperiodic ("quasiperiodic") dynamics breaking down into a recursive spirals ("homoclinic bifurcation to chaos") are among the common bifurcations in nonlinear dynamical systems, and all of them have been observed in many neurobiological settings.

In the forced-dissipative (energetically driven and energy consuming) dynamical systems relevant to the neurosciences---this characteristic contrasts with the dissipation free momentum of the classical mechanics of astrophysical bodies---there are four "most generic" bifurcation scenarios as a parameter changes that may, but need not, lead to chaos (see below for definition) (for early and physically oriented treatments see Eckmann, 1981; Ott, 1981; Berge′ et al, 1984, Kaneko, 1983). These scenarios are: (1) Fixed point or cycle splittings into twice-as-long period lengths 1→2→4→8→16…called the subharmonic or "period doubling route"; (2) The transformation of fixed points to one and then more periodic orbits, multiple independent (nonharmonic, incommensurate) frequency oscillations, their mode lockings and then breakdown called the "quasiperiodic route"; (3) Fixed point or cyclic equilibria metamorphosed into irregular bursting patterns called the "intermittency route"; and (4) In the context of quasiperiodic dynamics, adjacent

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nonharmonic frequency encoding parameter spaces fusing, resulting in new periods that are the sums of their adjacent ones: period 2 + period 3 = period 5, in what is called the "period adding route". Technically precise classification of bifurcations involve much more careful definitions and well studied technical constraints involving such issues as the symmetries and dimensionality of the system of observables, how many control parameters ("codimensions") are required to reasonably realize the bifurcation and the particular way the fixed points of the system become unstable, all of which are directly explorable when the equations are known or can be hypothetically inferred from the qualitative behavior of real data.

We note a few examples from the wide variety of bifurcating systems that can be found in the biomedical literature of interest for the biological sciences. With substrate input rate as the bifurcation parameter, the phosphofructokinase regulated glycolytic cycle in yeast extract was found to change among steady state, periodic and period doubling (subharmonic) regimes (Boiteux et al, 1975). Transitions between steady state, oscillatory and chaotic patterns have been reported in variety of physiological measures in man including respiratory rhythms and circulating blood cell concentrations over time (Mackey and Glass, 1977; Glass and Mackey, 1988) and models of dopamine cell dynamics (King et al, 1984). Flow rate parameter sensitive periodic, bursting and chaotic behavior has been found in a peroxidase-oxidase system (Olsen and Degn, 1977). A brain enzyme, substantia nigral dopaminergic tyrosine hydroxylase, manifested different saturation and fluctuation patterns, including bursting and periodicity, in experiments in which low (physiological) levels of tetrahydrobiopterin cofactor were the bifurcation parameters and adrenergic drugs were used as modulators (Mandell and Russo, 1981).

All four of the generic bifurcation routes to chaos, period doubling, changing multifrequency (quasiperiodicity), period adding and bursting (called "intermittency") were observed in self-sustained oscillations induced in the neural membranes of space clamped, giant squid axons that were immersed in a 550mM NaCl, and electrically stimulated over changing amplitudes and frequencies (Aihara et al, 1986; Takahashi et al, 1990). With external stimulus current level as the control

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parameter, the R15 cell of the abdominal ganglion of the Aplysia demonstrates transitions between bursting and periodic modes as well as period doubling, a signatory period 3 and the Lyapounov characteristic exponent evidence (see below) for the discontinuous onset of chaos (Canavier et al, 1990). Manipulating feed back delay, the human pupillary light reflex will bifurcate into regular oscillations (Milton and Longtin, 1990). A transition between a regime of irregular discharging to oscillatory bursting behavior was induced in basal forebrain cholinergic neurons by neurotensin (Alonso et al, 1994). Sympathetic nerve discharge in decerebrate, ventilated cats demonstrated transitions between periodic, multiple periodic (quasiperiodic with changing ratios to the ventilation frequency) and subharmonic behavior in response to inferior vena cava occlusion, vagotomy, aortic constriction and spinalization (Porta et al, 1996). Period adding bifurcations were induced by changing calcium concentrations or the addition of a potassium channel blocker in the "pacemaker" formed when (rat) sciatic nerve is chronically injured (Ren et al, 1997). Changing levels of the L-type calcium channel antagonist, verapramil, alter the pattern of vasomotion of rabbit ear arteries among sets of multiple independent periods, "quasi-periodicity," mode locking and chaos (De Brower, 1998). At critical intensity and frequency, flicker visual stimulation of the salamander generates a pharmacologically modifiable period doubling bifurcation in their ganglion cells (one spike for every two flickers) which is also seen subjectively and in occipital lobe evoked potentials at critical frequencies in bright, full-field flickered humans (Crevier and Meister, 1998).

Qualitative and Quantitative Universality in Nonlinear Dynamical Systems

"Universality" (see above) entered the parlance of physics in the context of the statistical mechanics of phase transitions near their critical points (Stanley, 1971; Stauffer, 1985; Yeomans, 1993) and has come to refer to the finite set of transitions and quantities common to nonlinear systems arising in their neighborhoods. A common physical example is the triple point of water-ice-steam on the temperature-pressure phase plane where a small change in temperature or

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pressure leads to a global qualitative change in physical state. Analogously, the loss of topological equivalence occurs at the fixed point that, for examples, splits into two or explodes into a cyclic orbit in phase space. The same critical point behaviors and quantities occur in a wide variety of specific processes and their equations, and they are independent of the way the trajectories first arrived in the fixed point neighborhood. Once the system enters the regime of critical behavior, the predictive significance of its dynamical history is lost. This may also be the case for emergent psychiatric disorder (Mandell et al, 1985; Mandell and Selz, 1992; Ehlers, 1995; Paulus et al, 1996; Huber et al, 1999).

There are diagnostic patterns of behavior when a nonlinear system is in a neighborhood of a potential bifurcation. They include sudden and/or large jumps resulting from a small change in experimental conditions, the appearance of big baseline fluctuations (anomalously large variance), the lengthening of the time required to relax following evoked or spontaneous perturbation ("critical slowing"), the same global change in state occurring at different values of the parameter when increasing versus decreasing a parameter's value ("hysteresis"), the existence of some range of values of the observable that cannot be attained by manipulation of the parameter ("inaccessibility") and the availability of two or more distinct states in the same parameter neighborhood ("modality") (Thom, 1972; Arnold, 1984; Gilmore, 1981). It is perhaps relevant to polydrug psychopharmacology and clinical management that the higher the co-dimension (the greater number of effective parameters being manipulated), the greater the accessibility and control of selected state stability becomes with respect to difficult to obtain behaviors. Examples of the potential advantages of simultaneous manipulation of multiple influences have been developed for affect disorder and anorexia nervosa (Callahan and Sashin, 1987).

As evidence for the independence of critical behavior from specific history, the qualitatively universal bifurcations along the four canonical routes to chaos manifest dimensionless ratios of parameter and phase space geometries between bifurcations. These ratios are quantitatively universal. The formalisms that rescale the distances from fixed points in parameter and observable spaces result in the same picture across scale, a dilatational symmetry (also called self similarity or

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affinity). They are called renormalization group equations, and, with respect to prediction, they replace any or all of the original specific predictive equations for the particular system under study (Cvitanovic', 1989). Whereas the U sequence and critical point behaviors are manifestations of qualitative universality, these scaling numbers are manifestations of quantitative universality. We discuss them here because their omnipresence in computationally realized differential equations as well as physical and chemical experiments along with their quantitative specificity (with values in all systems as "constant" as π) constitute a most persuasive argument for the substantiality of modern dynamical systems approaches to brain and other biological research.

The physical and physiological requirements for manifestations of these universal bifurcation scenarios can appear to be remarkably minimal. In physics, for example a full panoply can be observed in a "dripping faucet" (Shaw,1984). Similarly, a small piece of extirpated and perfused myenteric or femoral artery will demonstrate these transitions in vasomotion spontaneously and almost independent of flow rate (Stergiopulos et al, 1998).

Feigenbaum discovered that in dynamical systems manifesting a series of period doubling bifurcations, the ratio of the parameter value at which the next period doubling bifurcation occurred relative to the last one $\approx \frac{1}{4.6692}\ldots$ and the ratio of the magnitude of the spawning point to the one spawned $\approx$ 2.5. (Feigenbaum, 1979). By "rescaling" distances along a parameter value (see below) using what is called a "universal renormalization operator" the geometric situation around each bifurcation point (though of different absolute "size) remains relatively the same. In intermittent systems, burst length varies as the inverse square root of the distance of the value of the parameter from that value that elicited the fixed point (Manneville and Pomeau, 1980). The universal characteristic of the third common parametric route to chaos, quasiperiodicity, is that the ratio of independent frequencies found most resistant to mode locking and breakdown into chaos is, $\frac{\omega_i}{\omega_{i+1}}$ = 1.618... the number to which the ratio of adjacent Fibonocci numbers converge (1, 2, 3, 5, 8, 13,

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21...) (Shenker and Kadanoff, 1982). Similar quantitative scaling properties were also discovered in the parametric period adding route (Kaneko, 1983).

All of these scaling numbers have been found in experiments and in remarkable agreement with theory. Examples have been discovered in electronic circuits, hydrodynamic and mercury flows, acoustic systems, laser dynamics and oscillating chemical reactions (see Cvitanovic', 1989, for representative list of references). Whereas qualitative evidence for all of these bifurcation scenarios have been found in brain relevant experiments, there is yet to be a bifurcating experimental biological system with adequate precision across a sufficient range of magnitudes such that quantitative universality could be demonstrated across a sufficient range of values to be convincing. We remind ourselves that in order to establish a Fiegenbaum number, each period doubling bifurcation of the several required necessitates about a five-fold improvement in the experimenter's ability to specify the control parameter.

Using Invariant Measures of Dynamical Neurobiological Systems

Before the modern era of dissipatively forced (energy utilizing) dynamical systems research, the known attactors of an experiment's initial values resulted from their convergence onto either a fixed point or a limit cycle. An attractor can be regarded as a set which remains in bounded space and to which all orbits in this neighborhood converge (Milnor, 1985). Since by the rules of differential equations, orbits are required to be both smooth (graphable without lifting the pencil) and unique (different trajectories don't intersect since the point of intersection would no longer be unique), the foundational Poincare-Bendixon theorem says that any such orbit confined to a two dimensional phase space that doesn't converge to a fixed point must, no matter how long it irregularly wanders, must, eventually intersect with itself and then go around the same route again in a (perhaps very long) cycle. In most neuroscience research as well, we have generally regarded our data as manifesting either tolerable (or intolerable) fluctuations around mean values (fixed

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points) or more or less regular cycles. We analyze our "fixed point" data using quantities such as the mean and variance of distributional statistics and the cycle data using the amplitude, frequency, cycle length and phase of trigonometric functions. In central tendency-oriented research, rare, very high amplitude events have usually been considered aberrations and tossed, and imperfect periodic behavior is treated by "cosiner analysis" as regular cycles contaminated by measurement or system noise. Whereas technically, chaotic dynamics must live in dimension greater than two (for orbits to be more than a fixed point or limit cycle, able to snake around without necessarily intersecting), the Lorenz attractor has dimension just a little over two, our difficulties with establishing the "true" physiological dimension of real biological observables (see below) makes such a consideration more theoretical than practical.

The orbits of a forced-dissipative dynamical system in a parameter regime engendering chaos, converge onto an attractor which is neither a fixed point nor a limit cycle, thus the origin of the name "strange attractor" (Ruelle and Takens, 1971). It was James Yorke that first named these dynamics "chaos" (Li and Yorke, 1975). The necessarily statistical properties of the chaotic orbits on strange attractors follow from the generic characteristics of their motions (see Shaw, 1981 for a still conceptually current, non-mathematical treatment). These kinds of statistics are studied in a research context called the "ergodic theory of dynamical systems" (Ruelle, 1979; Eckmann and Ruelle, 1985). Ergodic is a word used to characterize a system with (or without) a particular condition placed on its statistical measures: the existence of an invariant measure which is undecomposabile into two invariant measures and, equivalently (though not obviously) one in which the time average equals its average in the geometric space into which it is embedded. One may arrive at the same ergodic measure from studying a single very long orbit or from summing across many individual but shorter orbits. This ergodic equivalence is made possible due to the definitional existence of at least one invariant statistical measure and the dynamics of the system which ideally include a uniformly, sequence disordering process called "mixing" (see below).

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Of course, most real biological dynamics are not uniformly mixing and so are non-ergodic, but we shall see that the ways they fail to be ergodic (and thus remain in the conceptual context of ergodic measures) are descriptively useful (Mandell and Selz, 1997a). The emergence of many statistical approaches to characterizing these motions have been accompanied by the expected controversies about which is best or correct (see below) and have been applied to the problem of diagnosis and clinical discrimination in a variety of neuroscience settings. In ideal abstract chaotic dynamical systems called Axiom A (Russians called them "C systems"), where most mathematical theorems are proven (Smale, 1967), all these measures, if properly computed, are equivalent. In real life, as in the related case of ergodicity, they are not, and since no single one is complete, the more (incomplete) measures we use in our studies along with interest in the way that they differ, supplies more useful information about the system. Though researching and elucidating the most reliable and valid ways of computing these measures are a valuable goal, the current debates focused on the superiority of a single particular measure, constructed in a particular way in relationship to issues of insoluble absolutes like "randomness" versus "deterministic chaos may not be particularly valuable for uncovering new characteristics and potential mechanisms underlying a specific set of real neurobiological observables.

Emphasizing diversity and relevance to the clinical biological sciences, we note that quantifying patterns in ergodic (non-ergodic) measures have aided: the discrimination between normal and abnormal opticokinetic nystagmus in neurology patients (Aeson et al, 1997); localizing a two year old subcortical stroke in an EEG of a patient with no other signs or neurological findings (Molnar et al, 1997); the diagnosis of early (not late) multiple sclerosis, as a nonspecific long tract disorder, in patients with mild optical neuritis using cardiac rate dynamics (Ganz and Faustman, 1996); seizure prediction from minutes to hours before the event in which subthreshold, pre-phase transition spatial diffusion and oscillations in characteristic changes in these measures can be found (Martinerie et al, 1998; Elger and Lehnertz, 1998; Pign et al, 1997; Iasemidis et al, 1990); using these measures on the EEG to differentially predict hereditary predisposition to alcoholism

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(Ehlers et al, 1995); indicating the presence or absence of septic encephalopathy (Straver et al, 1998); using time series from jejunal manometry to discriminate objectifiable somatic from psychological conversion related irritable bowel syndrome (Wackerbauer et al, 1998); analyzing time-dependent patterns in plasma hormone levels to discriminate between the presence or absence of a functioning tumor (Hartman et al, 1994, Mandell and Selz, 1997a); automated differentiation of ataxic from normal speech (Accardo and Menulo, 1998); and discrimination of temporomandibular joint dysfunction from normal patterns of chewing motions (Morinushi et al, 1998).

Styles of Orbital Motions in Chaotic Dynamical Systems

In chaotic dynamics, in various specific ways, an initial hypothetical handful of points lined up along the trajectory and acted on over time by the nonlinear differential equation ("operator"), get out of order in an unpredictable way. Here the hypothetical handful can come from a statistical aggregate of initial conditions or from a single recursive orbit studied over long times. As noted above, ergodic theorists call this getting out of order "mixing" and how and to what degree this happens consumes many mathematical theorems but for purposes of brain research, it can be best described using a variety of statistical measures. For example, visualizing the Lorenz attractor (see above) as a butterfly in phase space, the points get out of order because as they spiral out ("stretching") to the edge of one wing and return ("folding") to the unstable fixed point on the butterfly's body whence they either jump to some place on the other wing to spiral to its edge or return to the same wing to spiral out again. Which one of these is chosen is exquisitely sensitive to very small changes in where the trajectory started and very small fluctuations in where it returned to the unstable fixed point on the butterfly's body. In fact, specification of these locations is beyond the precision of any real, thermodynamically vulnerable system.

Chaotic trajectories on the Rössler attractor (see above) wind out ("stretch") to the edge along the inside of a conch shell in phase space and then are mapped

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back ("fold") into the spiral unpredictably somewhere in a mixing mechanism that has been called "displaced reinjection." In the slow-fast oscillations of the forced van der Pol in the chaotic regime, points in the slow phase ("repolarization") jitter around and step on each other's heels, getting out of order while waiting on the ledge before jumping ("depolarization") to the next slow phase ("repolarization") at some unpredictable time, thus generating a variably irregular series of interspike intervals.

Stretching and folding are also responsible for getting points get out of order in the single maximum map of the unit interval (studied for universal qualitative and quantitative properties by May and Feigenbaum and others as described above). With increases in parameter values, the parabolic hill function onto which the unit line has been stretched gets steeper, more stretched. Mapping points on the hill back onto the straight line of the unit interval results in what amounts to the line folding back on itself. This stretching and folding eventually fills the line with points, but their sequence, from end to end, gets shuffled like a deck of cards.

As described more generally above, points that start as neighbors may get separated ("divergence along the attractor") and those that start at a distance from each other may be thrown together ("compression back onto the attractor"). These expanding and folding motions that characterize the chaotic behavior on strange attractors have been likened to the actions of a taffy puller (Rössler, 1976). It is in this way that nearby points can separate without leaving the attractor. It is also the case that once indistinguishably close but then separated points may be compressed together again generating new, temporary (unstable) cycles of all possible period lengths. These unstable fixed points may be the most important feature of chaotic systems from the standpoint of new ideas about brain mechanisms (Pei and Moss, 1996; So et al, 1997). This aggregation of unstable loops can occur from points fluctuating away and back to the attractor as well as during the crowding of points at the turns after their stretching out on more linear parts of the flow. Under the mixing flow of a chaotic dynamics, it is also true that a single point eventually explores the entire attractor, no attractor location is inaccessible to it.

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Although counter-intuitive when expressed in words, the trajectories that one sees in the graphics of chaotic attractors result from the actions along the "unstable" directions of the stretching distortion; the actions in the otherwise invisible stable directions "iron down" the points onto this unstable manifold (n dimensional abstract surface).

As might be expected from this set of characteristic motions, the diagnostic triad of chaotic dynamical systems are: (1) Sensitivity to initial conditions—tiny distances between starting points are magnified and large distances between starting points are reduced under the stretching and folding actions of the system; (2) The presence of a theoretically infinite but countable number of unstable periodic orbits of theoretically all period lengths—points in phase space can be viewed an attractive-repellers, visited and left by the orbits recursively as the dynamics proceed; and (3) Indecomposability—the attractor is not separable into isolated regions and no points escape (see Devaney, 1989, for one of the clearest definitions). Of particular relevance to information encoding and transport by brain mechanisms, it is important to visualize that new information in the form of unstable periodic orbits is being created as well as destroyed by the dynamics. The logarithmic rate of formation of these new orbits is computed as the system's topological entropy (see below).

Assuming the real neurobiological system under study is behaving in these ways (and often much has to be done to help justify such a claim), the observables take the form of an irregular and/or episodic time series of amplitudes, as in repeated sample, neuroendocrine studies of plasma hormone levels (Veldhuis and Johnson, 1992) or a sequence of times between events as in neuronal interspike intervals (Katz, 1966; Perkel et al, 1967). These time or time-sequence series are generally studied from three relatively distinct yet complementary quantitative perspectives: (1) As stochastic ("random") processes with various amounts of sequential dependency (autocorrelations) and scale (sample length) dependencies; (2) As "deterministic" smooth or discrete, vectorial geometries in phase space following reconstruction and/or embedding of the series as phase portraits or return maps; (3) As information generating and transporting, topological (about relative

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nearness and sequential order not absolute distances), symbolic dynamical processes which as either (1) or (2) can be analyzed with respect to its various entropies, algorithmic complexities and word content and syntax. A variety of techniques aimed at deciding between the relevance of one or another of these underlying assumptions (such as series and Fourier phase shuffling to destroy statistical autocorrelations and vectorial continuities but leaving the probability density distributions intact) may at times help emphasize one or another of these orientations in the analyses (see Ott et al, 1994 for a collection of articles on this topic).

Nonconvergent Distributions and Power Law Scaling in Biologically Relevant Time Series

The statistical distribution with which most of us are familiar is the Gaussian which can be generated by summing and averaging a series of independent random events. The average behavior head/tails probabilities observed by one person flipping a fair coin for a very long time or by many people flipping similar coins for shorter times converges upon the invariant measure of 0.5. The variance, "second moment" in the distribution of a population of coin flipping sequences will be finite and computable. In a graph of this distribution, the tails will converge to the x axis in a Gaussian exponential manner. The longer or the more numerous the "sample" series of observations, the closer they will approximate the "ergodic" invariant measures representing the true "central moments" of the behavior of this "population" of fair flipping coins. Since the coins are not changing their relevant characteristics over the time of observation, we say that the series is not time dependent but instead is "stationary." Computation of correlations over increasing lags to determine how much and for how many flips the sequences continue to resemble themselves yield an exponential decay with a single characteristic correlation length. This reflects the existence of a finite variance from which its amplitude is derived and serves as the single characteristic temporal scale of the random process.

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Before describing the relatively new set of measures of biological processes designed to find and quantitate what are assumed to be relatively sample size insensitive, distributionally nonconvergent and multiply correlated processes that are without a single time or space scale, we should remind ourselves that there is already much more apparent "order" in a generically random situation than our intuitions would lead us to believe. For example, if we keep cumulative scores in a competition between heads and tails and determine the distribution of trials between those in which the number of heads and tails are even, we will get periods between zero crossings of many lengths with very short ones and very (very) long ones being most statistically prominent. The distribution of these wavelengths is shaped like a symmetrically fat-tailed, bowl (Feller, 1968). As another illustration, expected runs of heads or tails in this Gaussian random task are longer and more frequent than we might suspect. It has been proven that the expected run length grows with *n* coin flips (as an order of magnitude estimate) like the logarithm (for a fair coin, base 1/p = 1/0.5 = 2) of *n.* For example, in 512 (e.g. 2^9) tosses, we cannot report a run of 9 heads as a evidence for a biased coin or the sign of some deterministic coin tossing mechanism (Erdos and Renyi, 1970). If we had a 0.6 head biased coin, then the observation of a run of 13 heads couldn't dissuade us from a random mechanism!

Unlike our random coin task, the variances of many, perhaps most, time series of biologically-relevant events, do not tend to converge onto a limiting value as sample size, *n*, grows, but rather continue to increase (or decrease) with *n* in a scale invariant manner. Instead of "regressing to the mean" with increasing sample length or number, the likelihood of a larger deviation than previously observed increases with *n.* Analyses of inter-event intervals reveals a multiplicity of characteristic times. One interpretation of these finding might be that this represents evidence for the inherent "nonstationarity" of biological mechanisms as reflected in, for examples, the frequency of saccades concomitant with ceaselessly shifting foci of visual attention (Steriade and McCarley, 1990), or our inability to not think of "white bear" when so instructed (Wegner, 1994). Hermann Haken, the father of laser-inspired "synergetics," has said that biological mechanisms are not in a steady

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state for very long, spontaneously and irregularly jumping from one unstable dynamical state to another (1997). This suggests that meaningful tension between experimental sample lengths long enough to minimize statistical error and short enough to be stationary may be, for the biological sciences, more apparent than relevant.

The studies reviewed below exploit measures arising from the view that the noisy statistics of nonstationarity in biological processes are not a sign of measurement error, but rather evidence consonant with the statistical physics of nonequilibrium states and phase transitions (Stanley, 1971; Stauffer, 1985; Yeomans, 1993). Very high amplitude fluctuations and multiple, up to infinite, correlation lengths are characteristic of the normal, on-going biological dynamical behaviors, which are apparently without characteristic amplitude and time scales. From this point of view, if most or all information is widely distributed in the brain (e.g., serial order of visual tasks involving motor cortical neurons, Carpenter et al, 1999)) then the "binding problem" (see above) could also be solved by multiple, up to infinite spatial and temporal correlation lengths in place of the current theories of monofrequency resonances (Singer, 1993). Hierarchical neurodynamical mechanisms communicating across many mechanistic temporal and spatial scales, brain information transport analogous to the energy cascade of hydrodynamic turbulent velocities (Tennekes and Lumley, 1972), would be likely in the parametric vicinity of incipient bifurcations and phase transitions.

Three closely related techniques for quantifying the systematic changes in average fluctuation amplitudes with n (scale, sample length) involve a "power law," linear slope relationship between the logarithm of an index of variability and the logarithm of sample segment sizes. These easy, yet powerful methods were brought to experimentalists' attention by Benoit Mandelbrot (Montroll and Badger, 1974; Mandelbrot, 1983; Fedor, 1988; Bassingthwaighte et al, 1994; Liebovitch, 1998). To estimate the exponent in Hurst rescaled range analysis, we compute the standard deviation and the range of the deviation of the running sum from the mean on sequential subsamples of increasing size. The Hurst power law exponent is the slope of the straight line formed by graphing the logarithm of the subsample length

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along the x axis and the logarithm of the ratio of the range to the standard deviation on the y axis. An independent random system has a Hurst of 0.5. If a sequential increase or decrease in an amplitude or inter-event time tends to be followed by a change in the same direction, the Hurst > 0.5. If an increase in the measure tends to be followed by a decrease, then Hurst < 0.5. Computation of the Fano factor (power law exponent) exploits the same general strategy using the variance/mean in place of the range/variance and counting the number of events (such as single neuron discharges or heartbeats) in time windows of increasing length, generating a similar log-log graph. There is a relatively long history of the use of spike-number variance-to mean ratio in studies of response variability in visual cortical neurons (see Teich et al, 1996 for a review). The Allen factor (power law exponent) tends to reduce the influence of local trends by a computation of the variance of the difference between the number of events in two successive time windows divided by twice the mean number of events in the window.

Each system's invariant logarithmic slope across sample segment sizes takes the place of its missing finite variance in characterizing experimental data in which the distributional tails do not converge (or do so very slowly) to the x axis. Recent approaches to these measures in the context of stochastic analysis of DNA sequences, but also applied to normal and pathological cardiac inter-beat intervals and gait interval sequences, have dealt with the influence of non-stationarity due to apparent trends in the data on α-equivalent indices by local mean-normalization of the fluctuations at each window size (Peng et al, 1993; Peng et al, 1995; Hausdorff et al, 1995).

The rate of decay of the densities in the tails of the probability distribution as they approach extreme values along the x axis, called the Levy exponent when represented in Fourier space (technically, as a "characteristic function" of the probability distribution) (Shlesinger, 1988; Shlesinger et al, 1995), can also be computed directly on the distribution by fitting the tails with a two parameter curve quantifying their "fatness" and rates of decay (Mantegna, 1991). We can speak of a Gaussian tail as having an exponential decay rate representable by $\alpha = 2$ implying

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finite variance. A tail with a nonconvergent decay rate of $1 < \alpha < 2$ indicates non-finite variance in the data such that the usual "normal curve" derived, standard deviation dependent tests of statistical significance are without meaning. $\alpha < 1$ indicates the data is without a consequential mean and will require the use of interquartile measures to locate the center of the distribution (Adler et al, 1998). Recalling that the Hurst, Fano and Allan indices are invariant across sample segment size, we remind ourselves that, as is the case in the finite mean and variance, $\alpha = 2$, Gaussian, any of the other "α tails" also retain their value ("shape") across all partitions that might be used to sort and sum the observable. This property is called convolutional, α, stability. In passing it should be noted that the last outpost of convergence of a probability density distribution with $\alpha = 2$ is called "log-normal," in which the tails along the x axis are "pulled in" by the variable being plotted as its logarithm.

A Hurst exponent of > 0.5 in the data is associated with a Levy exponent of < 2.0, and both would be indicative of a process in which the characteristic style of change, rather than decay with some finite correlation length, would persist across all time. Using a bursting neuron as a generic example, a short interspike interval would, on the average, be followed by another short one and a long one by another long one, and this behavior, unlike our fair coin flipping sequence of observables, would not become uncorrelated with itself even over infinite time. Another way to represent this infinite, innumerably lengthed, correlation property is via its implicate frequency (inverse wavelength) content by computing its best fit assortment (along with their densities) of a range of short to long sine waves forming the Fourier transformation of the correlation function. The condition of correlated fluctuations across many measured temporal scales yields yet another power law slope when graphed as the logarithm of its range of frequencies, f, plotted along the x axis, versus their corresponding amplitudes squared, powers, plotted along the y axis. Naming this spectral power law exponent β, the system's characteristic scaling law is usually expressed as $\frac{1}{f^{\beta}}$ (Fedor, 1988; Hughes, 1995; Shlesinger, 1996;

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Liebovitch, 1998).

We see that the Hurst exponent, Fano and Allen factors, Levy exponent and power spectral scaling exponent are kindred statistical descriptors. They are most usefully applicable to systems with distributions that fail to be Gaussian or asymmetrically Poisson, the latter from random data sequences with only positive x values, thus backed up toward zero by a minimum inter-event interval or amplitude. These time series are sequentially dependent, not conventionally stationary, without finite central moments and with self-correlations that don't demonstrate Gaussian exponential decay with sample length or time. The following are some examples of the use of these measures in studies of biological dynamics. .

Examples of Biological Data with Divergent Distributions and Power Law Scaling

A paradigm challenging group of experiments involved models and measures of the distribution of characteristic open and closed times of membrane ion conductance channels. The usual approach to this problem assumed the existence of a small set of distinguishable channel types that were reflected in discrete conductance events with a small set of characteristic open and closed times. The distributions of each of could be fitted with its own, Markov process derived, exponential. With technical advances and improved temporal resolution, more characteristic times and their associated $\alpha = 2$ exponentials were reported with as many as three not being unusual. Liebovitch (and Sullivan,1987; 1989) used analogue to digital transformation of current recordings from the unselective corneal epithelial channels and voltage dependent potassium channels in cultured mouse hippocampal cells at temporal resolutions ranging from 170 to 5000 Hz and found similarly shaped, $\alpha < 2$, nonconvergent distributions across temporal scales. This led these investigators to suggest that, related to the >16 recorded magnitudes of characteristic times, from picoseconds to months, in autonomous protein motion (Careri et al, 1975; Gurd and Rothgeb, 1979), that there was an "α stable" hierarchy

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of lifetimes of states, observable at almost any temporal resolution that methods would allow.

Early and representative studies comparing the fit of the data with hierarchical scaling functions versus a sum of a small number of Markovian exponentials included studies of a calcium activated potassium channel in human fibroblasts (Stockbridge and French, 1989) which yielded evidence to support both models, as did studies of membrane conductances in corneal epithelial cells by another group (Korn and Horn, 1988). In a systematic comparison of scaling and Markov exponential modes of the gating kinetics of GABA activated chloride channels, acetylcholine activated end plate potentials, calcium activated potassium channels and fast chloride channels (McManus et al, 1988), it was found that the latter fit the data best in most experiments. Similar results were reported in studies of the glutamate and delayed rectifier potassium channel with respect to distributions of open and closed times (Sansom et al, 1989). Space does not permit a systematic account of the continuing debate and conflicting studies about these representations and the implicit biophysics of discrete, finite versus continuous, hierarchical channel event heterogeneity. It is interesting that recent experiments making use of Hurst rescaled range analyses of time series of whole cell membrane voltage fluctuations (without the assumptions and current renormalizing procedures associated with patch clamping) have yielded additional evidence for multiply correlated, Hurst > 0.5, $\alpha < 2$ power law behavior of what some might regard more generally as a protein relaxation time mediated hierarchical array of ion conductance behaviors (Liebovitch and Todorov, 1996).

Following the discovery of (very) subsaturating ("far from equilibrium") rat brain levels of the common cofactor for tyrosine and tryptophan hydroxylases, tetrahydrobiopterin (Bullard et al, 1978), studies of amino acid substrate saturation functions and time courses determined at these low, physiological co-reactant concentrations manifested patterns of hierarchical multiplicity and discontinuities suggestive of bifurcations and time-dependent fluctuations with fractional (hierarchical) time scaling exponents that were sensitive to psychotropic drugs

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(Mandell and Russo, 1981; Knapp and Mandell, 1983; Russo and Mandell, 1984a; Russo and Mandell, 1986). Similar bifurcating and power law kinetics were found in receptor-ligand binding systems (Mandell, 1984) which were confirmed by more recent studies of diffusion-limited binding kinetics with receptors immobilized on a biosensor surface (Sadana, 1998). Hierarchical kinetics have also been reported in time courses of drug and metabolite levels (Koch and Zajcek, 1991), tissue tracer washout studies (Beard and Bassingthwaighte, 1998), carrier mediated transport processes (Ogihara et al, 1998), general pharmacokinetic functions (Macheras et al, 1996) and biochemical networks (Yates, 1992). It is likely that bifurcating and hierarchical, power law kinetic functions will be studied more commonly in the chemical literature in general (Shlesinger and Zaslavsky, 1996; Berlin et al, 1996) as well as applied to a variety of protein-mediated biological functions (Dewey, 1997).

The first demonstration of and stochastic model for nonconvergent distributions of interspike intervals of a single neuron was by Gerstein and Mandelbrot (1964). Though rich with possibilities, it has been only very recently that additional work from this point of view has been published. This is likely due to the fact that most neuroscience oriented statistical packages, with rare exceptions, are without techniques for computing descriptive parameters for these divergent probability density distributions. This has not been the case for economic time series, download STABLE from http:///www.cas.american.edu/~jpnolan. Recently, applications of the Fano and Allan factor as well as power spectral scaling exponents to observed and shuffled series of spike counts and interspike intervals in the auditory and visual systems (including spatial and/or time resolved single unit recordings in retinal ganglion, lateral geniculate and lateral superior olivary cells as well a auditory nerve fibers) demonstrate the characteristic behavior of nonconvergent, hierarchical stochastic systems (Teich, 1989; Teich et al, 1990; Lowen and Teich, 1992; Kumar and Johnson, 1993; Kelly et al, 1996; Teich et al, 1997). These statistical techniques are well suited to the characterization of the irregularly intermittent bursting patterns generic for activity in single neurons as well

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as in nonlinear equations representing them and other brain processes (Mandell, 1983).

An early study of power spectral scaling in the EEG reported alpha band fluctuations that extended a $\frac{1}{f^{\beta}}$, $\beta \approx 1$ pattern to 0.02 Hz (Musha, 1981), as did other applications of the log-log power spectrum to the EEG in man (Hu and Hu, 1988; Prichard, 1992). This power law scaling led naturally to the suggestion that the range of frequencies available in the electromagnetic signal from the calivarial surface extends far beyond those currently appreciated and may be available for study using relatively noise free recording techniques such as the magnetoelectroencephalogram (Mandell and Selz, 1991). A not surprising range of intrinsic correlation lengths reflected in Hurst > 0.5 and/or Levy exponents < 2 have been reported in lamb fetal breathing patterns (Szeto et al, 1992). The exponent has been shown to be sensitive to maternal alcohol intake in humans (Akay and Mulder, 1998), rat neonatal motoric activity (Selz et al, 1995), and nuchal atonia duration sequences (associated with putative intra-uterine REM sleep) in fetal sheep (Anderson et al, 1998).

Sequential amplitudes in 1 Hz stimulated soleus spinal cord H-reflex demonstrated a $\frac{1}{f^{\beta}}$, $\beta \approx 0.83$ in control subjects and, reflecting the decrement in correlations, by 0.31 in patients with losses in supraspinal input from spinal cord injury (Nozaki et al, 1996). Whereas the sequences of fixation times in eye movements of normal control subjects reading difficult material demonstrated an exponentially decaying distribution, those of schizophrenic patients demonstrated a power law tail, consistent with more sequential correlations (Yokoyama et al, 1996). This finding may be related to the appearance of velocity arrests, runs of sticky fixed points, in a spatially oscillating target task, called “smooth pursuit eye movement dysfunction” in schizophrenic patients which has been modeled as a parametric disorder in a periodically driven nonlinear dynamical system (Huberman, 1987). The “short time fractal dimension” has been used to discriminate acoustic signal transformations from the speech of normal subjects and ataxic patients (Accardo

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and Mumolo, 1998). Spontaneous changes in the apparent syllabic sound made by regularly presented, word-like auditory stimuli emerge irregularly, the duration of perceived sameness demonstrating a power law distribution of "dwell" times (Tuller et al, 1998). The same kind of power law distribution of characteristic "brain times" can be found in studies of gait cycle durations in normal walking (Hausdorff et al, 1996) with a decrease in this locally detrended, α-like index compared with controls (0.91 ± 0.05) in patients with the basal ganglia disorders of Parkinson's (0.82 ± 0.06) and Huntington's (0.60 ± 0.04) Diseases (Hausdorff et al, 1998). Hurst > 0.5 has been speculated to more accurately quantitate the fundamental time structure of cells that was previously called circahoralian (ultradian) intracellular rhythms (Brodski, 1998).

Reconstructions of Time Series as Orbital Geometries

Rene Thom (1972), extending the ideas of Poincaré and D'Arcy Thompson (1942), argued that experimentally useful, intuitive connections between the qualities of biological processes and the quantities of an explicit (equations known) or implicit (equations unknown) dynamical system could be best achieved through the use of graphic representations of their geometric and topological forms. Notably successful examples can be found in the work of Thom, Arnold (1984) and Zeeman (1977), who were inspired by "caustics" (the shapes made on surfaces by the coincidence of reflected or refracted light rays) and Whitney's representation of parametric manifolds (surfaces) by the shadows they would make on a plane when back lit (Whitney, 1955). This led to a small number of qualitatively predictive, number-of-independent-parameters dependent shapes, such as "folds" "cusps" and "wavefronts." Experimentally crossing the values of these independent variable forms at their singular boundaries successfully predicted discontinuities in the otherwise smooth alterations in the dependent variable; i.e. bifurcations ("catastrophes") in the behavior of the observable. This approach was best suited to the study of systems with many independent variables and one dependent variable that could be mapped on the axis of the latter to represent a continuum of

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operationally defined "energy states." Smooth changes along the path of the nonlinear parameter manifold generated discontinuous changes in energy levels indicating states of the observable. Crossing a wrinkle in an "independent variable" (some call it "order parameter" to indicate its emergence rather than availability for predictable manipulation) such as the nonlinear parameter surface of the countervailing influences of survival fear and financial cost, may lead to a bifurcation in behavior from peace ("low energy") to war ("high energy") (Zeeman, 1977).

In a similar geometric spirit but dealing with nonequilibrium systems in motion, the conditions such that one could "smoothly" embed a trajectory like a continuously recorded EEG record, a complicatedly coiled snake into a three or higher dimensional box without loss of its essential dynamical or statistically measureable properties, was settled by Whitney in what is now referred to as the "embedding theorem" (Whitney, 1936). Starting with a tangled knot of overlapping vectorial orbits with apparent "non-invertable points" (given a point, one cannot chose among or between the more than one point that it apparently came from), it can always be unwrapped into a non-crossing trajectory satisfying uniqueness when reconstructed in a box of a little more than twice the parameter-determined dimension of the original space of observables.

A common technique for the spatial reconstruction of the output of a dynamical system is called a "time delay embedding." This approach, first suggested by Ruelle (1987, pg. 28) replaced the value, x, versus the time derivative, $\frac{dx}{dt}$, phase portrait plot described for a continuously perturbed bob on a spring above. A sequence of observables over time, in, for example, three dimensional "phase space" (Packard et al, 1980; Takens, 1981; Sauer et al, 1991), is depicted by a curve representing the system's trajectory at times t_1, t_2, t_3, by sliding one-by-one down the series and plotting each p_1, p_2, p_3, location with respect to each other along the x, y and z axes respectively. The choice of time interval between the points, the delay, can be delicate and usually some standard fraction of the decay time of the sequence's autocorrelation length, "the decay time of mutual information" is chosen. There are many technical considerations,

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including those involving the choice of the embedding space vis a vis the "true" dimension of the attractor. This becomes an issue when, for example, the attractor shrinks over time to some subspace of the initial embedding (Liebert et al, 1991 and references therein).

If we imagine the process of time series reconstruction to inscribe an attractor's untidy ball-of-string of recurrent trajectories in three dimensions, we can then, by making the z-dimension a constant value, cut the ball with a two dimensional plane, a "Poincaré surface of section." This could yield a roundish cloud of discrete points on the x,y plane and $t_{n-1} - t_n$ would be the time between two piercings of this surface. It has been proven that almost any cut, as long as it is made transverse to the direction of the orbital trajectories, is equally valid and useful for further analyses (Oseledec, 1968). If the original embedding and subsequence section was in high enough dimension to allow invertability, we might have enough (trial and error) knowledge to be able to write a discrete equation, a "return map," f, that would move one point to the next on the plane as $(x,y)t_{n-1} \xleftrightarrow{f} (x,y)t_n$.

What can sometimes be case with real systems (Coffman et al, 1986), is that reducing the geometric reconstruction still one dimension further, accepting non-invertability, ironing down the points in the plane onto the x axis line (normalized to [0,1]), and plotting the values at x_t against x_{t+1} ("mapping the unit interval to itself"), can generate points in the general shape of a parabola with dynamics representable by the same family of one parameter, single maximum discrete equations that generated May's sequence of bifurcations, Feigenbaum's scaling and Metropolis, Stein and Stein's (and Sharkovskii's) U sequence (see discussions of qualitative and quantitative universalities above).

Although sometimes a significant change in brain system physiology, such as penicillin-induced epileptic neuron spiking activity is revealed simply by a change in the graphic appearance of suitably embedded time series data (Zimmerman and Rapp, 1991), more often statistical measures made on the geometric dynamics of the points on the attractor are required.

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Orbital Divergence Characterizes Expansive Dynamics on Biological Attractors

In the dynamical world of equilibria (fixed points in phase space) and periodic cycles (fixed points of a return map), a common concern involves their stability. What happens if an adventitious jiggle moves the orbit a little distance away from the fixed point? Would the wind wiggled suspension bridge start to flap with increasing amplitude or would it damp back down quickly to its stable state. A "Lyapounov functional," L, is constructed which can be visualized like a smooth potential bowl around the fixed point such that any L stable solution that starts at its bottom tends to stay there or is asymptotically L stable if the solution converges to the fixed point at the bowl's bottom as $t \to \infty$. If the point is not L stable, it is L unstable.

The modern study of nonlinear systems have produced another kind of stability issue with a similar appellation yielding other direction specific indices, the Lyapounov characteristic exponents, $\overline{\lambda}$ (Oseledec, 1968; Eckmann and Ruelle,1985; Ruelle, 1990; Ott et al, 1994). In this context, the instability is not one of perturbative escape from a fixed point, but of the average rate with which the (theoretically infinitesimal) distances among a handful of points representing a set of initial conditions (each a precision limited, hypothetical repetition of the same experiment), are being stretched apart by the expansive action of a strange attractor system. In three dimensions, one can envision a ball of initial conditions being elongated along the unstable direction and ironed down from both sides along the stable direction over time, transforming the ball into an ellipsoid and then into a (recurrent) curve. In simplest terms and thinking about a one dimensional scalar time series, the Lyapounov exponent reflects the multiplicative average (logarithmic addition) of the sequence of slopes of the series of straight lines connecting the points. An average slope of > 45° is expansive such that a linear distance on the x-axis is increased when mapped onto the y axis. A slope of < 45° is a contraction mapping reducing the linear distance of the x-axis when mapped to the y axis.

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Rössler's generic chaotic system (see above) moving recurrently in a three dimensional box can be orthogonally decomposed into three directional motions in a moving frame, each with a signatory sign of $\overline{\lambda}$. The unstable direction of expansive stretching is characterized by some number > 0, $\overline{\lambda}(+)$, the stable direction of contractive folding, some number, < 0, $\overline{\lambda}(-)$, and the neutrally stable direction of recurrence, $\overline{\lambda}(0)$. For The "Lyapounov spectrum" of the Rössler attractor is $[\overline{\lambda}(+), \overline{\lambda}(-), \overline{\lambda}(0)]$ (Shaw, 1981). An n-dimensional dynamical systems has n one-dimensional Lyapounov exponents, and it is sometimes the case in relatively noise free, finite semi-stationary data lengths of the neurosciences, that a $\overline{\lambda} > 0$ can be shown to exist for a second one, in a dynamical situation called "hyperchaos" by (Rossler, 1979). For example, two and sometimes three $\overline{\lambda}(+)$ have been reported in the flows on the EEG attractor of normal alert subjects (Gallez and Babloyantz, 1991). The presence of measurement noise, the finiteness of neurophysiological sample lengths as well as the relatively small expansive actions in some directions in the chaotic attractors of brain dynamics lead to the finding that most often, only one "leading Lyapounov exponent," $\overline{\lambda}(+)$, is reliably computable (Sano and Sawada, 1885; Wolf et al, 1985; Eckmann et al, 1986).

A counter-intuitive fact about the stability of a dynamical system when a decrease in the value of $\overline{\lambda}(+)$ is observed such that $\overline{\lambda}(+) \rightarrow \overline{\lambda}(0)$, is that this more neutral stability augers a global bifurcation (Guckenheimer and Holmes, 1983). A small perturbation does not change the global dynamics of an already expanding and contracting (called "hyperbolic") dynamical system, it will maintain the style of its motions. However, when $\overline{\lambda}(+) \rightarrow \overline{\lambda}(0)$, a velocity changing perturbation evokes a bifurcation to a new dynamic in what is called "loss of hyperbolic stability." The best examples come from the observations of this kind of change in the EEG predicting the onset of epileptic seizures in patients with focal or temporal lobe epilepsy (Iasemidis et al, 1988,1990; Iasemidis and Sackellares, 1996).

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The number and variety of algorithmic strategies for computing Lyapounov exponents that are applicable to real data divide naturally into those that compute directly the average rate of separation of neighboring points from the "fiduciary" orbit, as observed on the reconstructed attractor, from which only the largest $\overline{\lambda}$ can be obtained (Wolf et al, 1985), and a variety of techniques based on assumed model maps of the unknown flow along which the sequential products of the local derivatives are computed. The logarithms of the straight line slopes of the sequence of directionally decomposed local tangent vectors multiplied, yield as many Lyapounov exponents as directions (Sano and Sawaka, 1985; Eckmann et al, 1986; Geist et al, 1990). The techniques of regularization by which these model processes approximate the unknown flow include those with least squares, linear fit assumptions (Eckmann et al, 1986; Sato et al, 1987; Buzug et al, 1990), more detailed fits involving polynomial expressions in higher powers (Briggs, 1990; Brown et al, 1991; Bryant et al, 1991) and techniques such as "singular value decomposition" which decomposes the flow into orthogonal components before computing the logarithmic rate of divergence of nearby points on each of them (Stoop and Parisi, 1991). A clever check on the Lyapounov number obtained is to study the flow backwards so that, for example, some rate of separation of points in the forward direction would approximate the rate of convergence in the time reversed data (Parlitz, 1992).

Among the sources of spurious Lyapounov exponents are sample lengths that are too short and/or too measurement-noisy to compute a statistically stable average, embedding dimensions that are too high or low and attractors (many of physiological relevance) that have geometric features such as sharp corners or tight folds as in the Rössler (where points gather) or delicate boundary points such as those on the body on the Lorenz butterfly (see above) where very small distances determine whether the orbit makes big jumps to the right or left wing leading to uncharacteristically large separations. This "nonuniformity" in the rates of expansion and contraction in the dynamics over the attractor, a source of error in computations of statistical indices of the average behavior, becomes a useful tool in characterizing individual differences in sets of neurobiological data ranging from

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brain enzyme kinetics (Mandell, 1984) and single neuron firing patterns (Selz and Mandell, 1991) to human psychomotor and cognitive behavior (Selz, 1992; Selz and Mandell, 1993).

The Leading $\overline{\lambda}(+)$ of Some Biologically Relevant Time Series

An early application of a simplified form of leading Lyapounov exponent to brain data involved the computation of the one dimensional averaged slope of in vitro studies of psychopharmacological drug and peptide effects on time series of catecholamine and indoleamine biosynthetic enzyme activities studied at physiological, far-from-equilibrium reactant concentrations (Russo and Mandell, 1984b; Knapp and Mandell, 1984). A contemporaneous study also suggested the influence of differences in initial conditions for pharmacokinetic equilibrium times in drug binding kinetics by proteins (Bayne and Hwang, 1985).

The most extensive applications to the clincial neurosciences of the Lyapounov measure of the exponential divergence of orbital points has involved reconstructed brain wave attractors from the intracranial or scalp recordings of the EEG (Duke and Pritchard, 1991; Dvorak and Holden, 1991; Jansen and Brandt, 1993). Space prevents us from surveying more than a small representative set of the studies (Jansen, 1996). It should be noted, however, that this is an area in which "state of the art" research has grown quite complicated and somewhat controversial with respect to technical issues. The choices of the digitizing frequency of the smooth record, the dimension of the embedding space and time delays continue to be debated in the context of numerical computations of $\overline{\lambda}$ and dimension measures (Mayer-Kress, 1986; Ott et al, 1994).

Controls for the implicitly required statistical discrimination between "randomness" and "deterministic chaos" consist of sequence and (Fourier) phase randomization generating "surrogate data" which conserve the probability distributions and destroy the correlation properties and attractor geometries (Sauer et al, 1991; Ott et al, 1994). Since neither bring with them any connections with

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known or explorable brain mechanisms, one might argue that at this early stage of the work it would be more desirable to simply report the quantitative findings, leaving unanswerable questions about ultimate causality for later discussion (see below).

The first EEG $\overline{\lambda}(+)$ was reported in a patient with epilepsy (Babloyantz and Destexhe, 1986) which was confirmed by others (Iasemedia et al, 1988; Frank et all, 1990). An important study of simultaneous time series from 16 subdural electrodes placed in the right temporal cortex of a patient with a right medial temporal lobe epileptogenic focus demonstrated that a decrease in a single lead's $\overline{\lambda}(+)$ reliably anteceded and localized the first signs of the incipient seizure. The rest of the leads followed with similarly decreased positivity in their leading Lyapounov exponents associated with spatially coherent patterns of behavior. In addition, the averaged value of the leading Lyapounov exponents in the 16 leads increased post-ictally over the averaged values of $\overline{\lambda}(+)$ in the pre-ictal state (Iasemidis et al, 1988,1990). These findings, including seizure anticipation for 25 minutes, were confirmed using intracranial recordings in 16 patients with temporal lobe epilepsy (Elger and Lehnertz, 1998). The para-ictal decrease and post-ictal increase in $\overline{\lambda}(+)$ found in patients with focal temporal lobe seizures was confirmed more generally in left and right pre-frontal-to-mastoid EEG recordings made before, during and after electroconvulsive shock treatment of psychiatric patients (Krystal and Weiner, 1991). Pre-ictal changes were also found six minutes before seizure onset from scalp EEG recordings in 17/19 patients with chronic focal epilepsy (Martinerie et al, 1998). The most exciting potential application of this approach is its use, in real time, for the prediction and prophylactic treatment of incipient seizures, minutes to hours before the event, in place of or augmenting long term drug management (Iasemidis and Sackellares, 1996).

There is a growing literature about leading Lyapounov exponent(s) in the reconstructed attractor of the EEG associated with a variety of normal and pathological human behavioral states. For examples, two and sometimes three

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$\overline{\lambda}(+)$ were reported in awake relaxed subjects and were lost in deep sleep (Stage IV) and coma (advanced Jakob-Creutzfeld disease), suggesting that level of consciousness correlated positively with amount of orbital divergence (Gallez and Bablioyantz, 1991). A "pathologically low" leading $\overline{\lambda}(+)$ was also found to be characteristic of the EEG of patients with Alzheimer's syndromes (Jeong et al, 1998). Technically defined sleep stages (I, II, III, IV, REM) were found to correlate well with the values of the leading $\overline{\lambda}(+)$ of the EEG in normal subjects (Fell et al, 1993; 1996; Pradhan and Sadasivan, 1996). EEG recordings during problem solving sometimes, but not always, demonstrated a relationship between values of $\overline{\lambda}(+)$ and the kind or amount of load of the task (Micheloyannis et al, 1998; Popivanovov et al, 1998; Meyer-Lindenberg et al, 1998). Both emotionally positive and negative videos increased the value of the leading $\overline{\lambda}(+)$ (Aftanos et al, 1997) as did computer generated music with sounds that exploited a "pleasing" hierarchical, 1/f but not an "unpleasant" $1/f^{2}$ frequency spectrum (see previous section about power law scaling) (Jeong et al, 1998). The EEG theta rhythm of "day dreaming" manifested a lower $\overline{\lambda}(+)$ than the "relaxed alert awake" alpha rhythm (Roschke et al, 1997). Relationships between the Lyapounov spectra demonstrated both regional independence and task-related dependence in the magnetoencephalography record in man (Kowalik and Elbert, 1995).

These and other studies suggest that divergence rate of orbits on a geometrically reconstructed attractor is a subtle measure, which can be quantified as a continuous variable and which has been found to be useful in a variety of neuroscience-related, experimental contexts. The range includes the characterization of the discharge pattern of a single somatic or renal sympathetic nerve fiber (Gong et al, 1998;Zhang and Johns, 1998); quantifying the results of perturbing autonomic nervous system activity, for examples, exercise, atropine and propranolol decrease $\overline{\lambda}(+)$ in the cardiac interbeat interval attractor (Hagerman et al, 1996) and interference with the function of the baroreflex or clonidine alters the $\overline{\lambda}(+)$ in the blood pressure attractor in man and animals (Wagner et al, 1996;

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Mestivier et al, 1998); and predicting defects in visual learning functions from decreases in the $\overline{\lambda}(+)$ of the cardiac interbeat interval attractor in patients with multiple sclerosis (Ganz and Faustman, 1996).

We recall that on theoretical grounds (Guckenheimer and Holmes, 1983), a decrease in the positivity of $\overline{\lambda}(+) \rightarrow \overline{\lambda}(0)$ in a delay coordinate, geometric reconstruction of a time series of observables may auger an incipient global bifurcation in the system's dynamics. As reviewed above, this has turned out to be the case in several studies of the EEG and electrocorticogram in epileptic patients. Futher research will be required to see if this idea has substance more generally for predicting "catastrophic" changes in other brain-related systems.

Power Law Scaling of Orbital Geometries in Time Series Reconstructions

Benoit Mandelbrot's book in its first incarnation was derived from his lectures at College de France in 1973 and 1974 and was called *Les Objets Fractals: Forme, Hasard et Dimension* (Mandelbrot, 1975). This essay was translated into English as *Fractals, Form Chance and Dimension* (Mandelbrot, 1977). Later expanded and reworked editions displayed another title, *The Fractal Geometry of Nature* (Mandelbrot, 1982) but the deep conceptual, sometimes poetic fusion and confusion generated by the apparent identity among the objects of his first title remains. "Fractal," along with "chaos" and "strange attractor" are among the most widely familiar new words in modern dynamical systems research. Fractal is the most difficult to rigorously define and is commonly misunderstood due to the evocative yet dream-like cognitive condensations provoked by the first title and its reflections in Mandelbrot's prose. A common conceptual confusion is exemplified by the assumed relation between "fractal time event distributions" of the cardiac interbeat interval and the "fractal like" anatomy of the purkinje network of the cardiac conduction system. Data from both contexts are often shown juxtaposed in the same illustration as though their relationships were obvious (Goldberger et al, 1990; Goldberger, 1996; Liebovitch and Todorov, 1996). "Fractal times" and "fractal

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geometries" are not related to each other essentially, either in the mathematical or physiological domain, but are often made vaguely equivalent on the basis of their lexical similarity.

An experimentally meaningful relationship between fractal statistics (hazard), dynamical fractals (dimension) and fractal geometries (form), has to be proven on a case by case basis and not assumed from their common designation. Among the informal attempts to do this have been those that involve the branching pattern of nerves and the associated reductions in their diameter-dependent characteristic conduction velocities yielding a multiplicity of "arrival times." There is, however, a more central idea common to these concatenated meanings of fractal: the statistical, dynamical and geometric expressions of "scaling," a word which is not mentioned in Mandelbrot's book titles. The cluster of theories, theorems and methods associated with the idea of scaling (and renormalization) have led to Nobel Prizes for Flory (1971), Wilson (1975) and de Gennes (1979) and the (equivalent mathematical) Field's Medal for McMullen (1994). There is speculation that the last two awards were supported by the inspiration and interest given their research by Mandelbrot's intuitions and books.

Scaling laws take the place of (unknown causal) physical laws by indicating the proportion by which observables of a system can be changed in relationship to each other such that some statement about them, "this varies with that," still holds. In a cross species comparison, as the average weight of a mammalian body, called lb, increases, the skeletal weight, called w, increases at an exponentially greater rate: w goes like $lb^{1.08}$ where $lb^{1.0}$ would indicate that they grew across species at the same rate. Plotting log (lb) on the x axis and log (w) on the y axis in a log-log plot results in a straignt line with a slope that indicates the power law scaling relationship between body weight and skeletal weight across mammals. The slope of the scaling exponent of 1.08 is a little over $45^{\circ} = 1$. In contrast, the metabolic rate, r, goes like $(lb)^{0.75}$, $r \approx (lb)^{0.75}$. Larger animals (relative to their weight) have lower basal metabolic rates (Schmidt-Nielsen, 1984). We don't completely know the chain of intervening mechanisms that relate these variables to each other but we do know

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invariant scaling laws that describe their relationships within some limits on the range of values.

In describing the functional size, radius of gyration, R_g, of a polymer such as a polypeptide, composed of N monomers, assume each of the amino acids to be the same and that they are in a "good" hydrophobic solvent that didn't stick the polymer together in a fold. Flory (1971) found a scaling law for certain broad classes of polymers and solvents, $R_g \approx \alpha N^{\nu}$, where the exponent, $\nu = 3/5$, was universal, N indicated the number of monomers in the chain and the value of "pre-factor" α depended upon the particular monomer and solvent chosen. Log R_g plotted against log N has a "power law" slope of 0.60. For an equally static but less physical example, there is the well known Zipf law of "vocabulary balance"(Zipf, 1949). First reported for the 260,450 words of James Joyce's Ulysses, the slope of the log of the rank of the words found (ordered from most to least along x) plotted against the log of their frequency (along y) results in a power law that is (generally) true for other collections of words and in other languages.

An accessible example of a dynamical scaling law arises in a two dimensional lattice model of a forest which is to be set on fire with probability p independent random single tree ignitions. At some critical p, p_c, the fire sweeps through the entire forest ("percolates") and the correlation length of the connected clusters grows as $|p-p_c|^{-\gamma}$ with a universal scaling exponent, $\gamma = 4/3$, for all Monte Carlo, two dimensional percolation problems (Stauffer, 1985; Grimmett, 1989).

Mandelbrot's scheme for the power laws that compose his fractal geometry of dynamical objects is a measure made on the pattern of occupancy in the embedding space by the reconstructed orbits of an attractor. It is, generally, $mass \approx length^{D_0}$ in which D_0 (the subscript that of the "capacity dimension") is not the whole number of Euclidian dimensions, d, of the space in which the orbits are embedded. After Hausdorff's "convergence of external and internal measures" (Hurewicz and Wallman, 1948), the (capacity) fractal dimension D_0 is also defined as being larger than its topological dimension and smaller than its Euclidian embedding dimension. Graphing a time series on a plane one can think of its

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topological dimension as that of a line equal to one. If each time step had the largest up or down amplitude as possible, its fractal dimension would approach (but not reach) that of the embedding plane, Euclidean d = 2.

The D_0 of the one dimensional Richardson technique (Mandelbrot, 1967) can be computed by covering the one dimensional surface of a time series with a number, #, of line segments of several orders of magnitude range of lengths, *l* .Graphing log(l) along the x-axis and log #(l) along the y-axis yields a negative linear slope, -s. As defined, $1- s = D_0$ noting that $(-(-s)\rightarrow+s)$ such that $1 < D_0 = 1+s < 2$. Strain differences and peptide and psychotropic drug-induced changes in D_0 computed in this way were found in time series of fluctuations in rat brainstem tyrosine and tryptophan hydroxylase activities under far-from-equilibrium co-reactant concentrations (Mandell and Russo, 1981; Knapp et al, 1981; Knapp and Mandell, 1983; 1984). Systematic influences of stimulant drug dose on D_0 were found as well in these systems (Mandell et al, 1982). This simple measure, made directly on the "roughness" of the graph of a one dimensional time series rather than on its orbital reconstruction, has been used to discriminate the pattern of fluctuations in daily mood scales in normal subjects and mood disordered patients (Woyshville et al, 1999). These findings confirmed dimensional scaling exponents on higher dimensional embeddings of similar time series in mood disordered patients (Gottschalk et al, 1995; Pezard et al, 1996). Due to the ease and rapidity of its computation, techniques involving D_0 on one dimensional time series are currently in development as possible real time epilepsy predictors when analyzing the output of a large number of EEG leads simultaneously.

If $M(\varepsilon)$ is the minimum number of d-dimensional cubes of side ε required to cover the d-dimensionally embedded attractor, plotting a logarithmic range of rulers of length ε (as $\varepsilon\rightarrow0$) along the x axis and a logarithmic range of number of cubes, $M(\varepsilon)$, each of corresponding ε-edge size, along the y axis, results in a negative (more smaller $M(\varepsilon)$'s and fewer bigger $M(\varepsilon)$'s) power law slope D_0. Here the numbered covering cubes, $M(\varepsilon)$, are those in which the probability of containing at least one point (its "probability density measure," often called μ) is not zero. We

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note that changing the ratios of the numbers of cubes that are dense in point probability to those that are sparse would not influence the value of D_0. This helps differentiate D_0 from other dimensions and, as noted above, D_0 as a maximal estimate of the fractal dimension, is called the capacity dimension and by convention the scaling law is written $M(\varepsilon) \approx \varepsilon^{-D_0}$. More specifically, D_0 is calculated by repeatedly dividing the d-dimensionally embedded phase space into equal d-dimensional hypercubes and plotting the log of the fraction of the hypercubes containing data points versus the log of the (normalized) linear dimension ("length scale") of the hypercubes. The slope fitted to the most linear part of the slope (usually the middle 50%) indicates the capacity dimension. D_0 is computed for increasing embedding (and cube) dimension, d, until it achieves an asymptotic plateau, it "saturates". This is but one of a range of geometric scaling exponents, "dimensions," that are currently being computed (Farmer et al, 1983; Grassberger and Procaccia, 1983; Meyer-Kress, 1986; Theiler, J. (1990); Gershenfeld, 1992; Ott et al,, 1994).

Although still subject to debate, convention has it that the sample length required to determine this most primitive of dimension computations goes like 10^{D_0} (e.g. a dimension of 2.45 requires a sample length of at least 282 points). Assuming robust findings using D_0 as indicated by non-parametric tests of significance in test-retest, before and after, drug treatment designs, this arbitrary criteria sounds more like ritual than meaningful help for the clinical neuroscientist with (say) 100 spinal fluid hormone and metabolite samples painfully and laboriously collected from a patient's indwelling catheter over 48 hours. In the context of real data (and not numerical studies of differential equations), we are dealing with empirical findings that must find their meaning (or lack of) in the context of questions about issues in the neurosciences, not in abstract questions such as those about the number of dimensions that an unknown differential equation would require to represent the data (Broomhead and King, 1986). In a similar arbitrary spirit, a system manifesting a $D_0 > 5$ is considered not discriminable from a random process; e.g. the difference between $D_0 = 5$ versus $D_0 = 7$ (though perhaps statistically significant) is thought to be without meaning. Since in neurobiological

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research, "random" (if it doesn't mean measurement error) indicates unknown degrees of freedom, this $D_0 > 5$ rule is also without relevance for brain research.

D_1 is called the "information dimension" and is computed by counting the number of ε-cubes, $M(\varepsilon)$, it takes to cover the points constituting some fixed fraction of all of the points of the set of orbital points on the attractor and can be regarded as the "core dimension" (without the outliers) of the set. The counterintuitive finding is that D_1 is nearly constant across a range of fixed fractions that are less than the whole measure (Farmer et al, 1983). The invariance of D_1 can even be taken to the extreme by computing the $D_1 = \lim_{\varepsilon \to o} \frac{\ln M(\varepsilon)}{\ln(\varepsilon)}$ around (typical, not all) single points. In this context, D_1 is called the "pointwise dimension" or "singularity exponent" and, as might be anticipated, its value is usually less than that of D_0.

The scaling exponent that is both sensitive to point densities and easiest to compute from real data is the "correlation dimension," D_2. Here, analogous to the relationship between the amplitudes of the variance and the correlation function in conventional statistics, the measure squared is of interest for the computation of D_2, e.g. $I(2,\varepsilon) = \sum_{i=1}^{M(\varepsilon)} [\mu(C_i)]^2$ (see below for this use of measure μ on sum Σ of cubes C_i). The selection of D_2 as the fractal measure dominates the studies that invoke scaling exponents to quantify the distributions of points on the attractor as reconstructed from time series in the neurosciences (Grassberger and Procaccia, 1983; Mayer-Kress, 1986; Ott et al, 1994). Several sets of programs are available for its computation (for example, Sprott and Rowlands, 1991). Generally, a correlation sum ("integral", $R(\varepsilon)$) is computed from a starting point by counting all subsequent point pairs with distances between them less than ε as $\varepsilon \to 0$ and plotting $D_2 = \frac{\lim}{\varepsilon \to 0} \frac{\ln(R(\varepsilon)}{\ln(\varepsilon)}$. D_2 is computed for increasing embedding (and therefore hypercube) dimension, d, until D_2 achieves an asymptotic plateau, it "saturates" (Ding et al, 1993).

It is generally the case that $D_0 \geq D_1 \geq D_2$ (Farmer et al, 1983).

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In his statistical explorations of experimental results in hydrodynamic turbulence, Mandelbrot (1974) called attention to the need for a multiplicity of characteristic scaling exponents, a range of values for each exponent and their sensitivity to orbital point density distributions (the latter called the Sinai-Ruelle-Bowen or natural measure (Eckmann and Ruelle, 1985)). These needs grew out of the intrinsic heterogeneity in the time dynamics and the nonuniform point distributions in phase space of orbitally divergent, real physical systems. Even with relatively uniform orbital point distributions, it is intuitively obvious that as $\varepsilon \rightarrow 0$, the smaller ε- cubes are over-represented and larger ε- cubes are under-represented in the $M(\varepsilon)$ computation (Farmer et al, 1983). For a concrete example, the fraction of the total number of cubes containing say 75% of the points would obviously decrease as the ε-lengths studied gets smaller. Normalizing the D_i measures with respect to point densities would correct for this systematic distortion. In addition, the non-systematic influence of real system heterogeneity and non-uniformity in both time and reconstruction space distributions makes the need for relating the D_i measures to the natural measure even more pressing.

The derivation of many separate scaling exponents, as well as global generalized exponents and the incorporation of point densities in their computation, has been approached by a kind of method of moments (Renyi, 1970; Grassberger, 1983; Hentschel and Procaccia, 1983; Halsey et al, 1986; Mayer-Kress, 1986; Ott et al, 1994). We outline the general arguments here so that the reader will be generally familiar with the ideas and terms, not to serve as a definitive summary. It is a complicated area and the reader will find the required detailed descriptions in the references. .

We recall that with respect to a statistical distribution, the first moment is the mean; the second moment, σ^2, the variance; the third moment, σ^3, the distribution's asymmetry, the skew; and the fourth moment, σ", its relative peakedness with respect to the probability mass in the tail, called the kurtosis. In these moment computations of an observable x_i's deviation from the mean, $|x_i - \overline{x}|^q$, the value for q accentuate particular regions of the density distribution. Similarly, the q's of the

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"generalized dimensions," D_q, emphasize different aspects of the relative point density that are assumed to be uniform in the computation of D_0. We recall from above that the power law slope constituting $D_0 = \lim_{\varepsilon \to o} \frac{\ln M(\varepsilon)}{\ln(\varepsilon)}$. If we emphasize the component of the probability (measure, μ) or, equivalently, time spent by the orbit in cube i, $\mu(C_i)$ instead of simply the number of cubes occupied by any points, $M(\varepsilon)$, along with the different length scales of the cube as $\varepsilon \to 0$ we have a generalized dimension. A common expression for the generalized dimension includes the fractional pre-factor in q written so as to make things come out right: $D_q = \frac{1}{q-1} \lim_{\varepsilon \to 0} \frac{\ln I(q,\varepsilon)}{\ln(\varepsilon)}$, where $I(q,\varepsilon) = \sum_{i=1}^{M(\varepsilon)} [\mu(C_i)]^q$. The higher the q, the greater the dominance of the higher probability cubes, $\mu(C_i)$. To see how this q-induced separation in emphasis might work, if the ratio for q = 2 between the probability containing cubes 0.25 and 0.05 is 25, their ratio for q = 3 is 125. For q = 0, the scaling exponent is the capacity dimension. This result of the actions of a changing q has been analogized to the way changing temperature in a thermodynamic system evokes different aspects of its behavior.

The "multifractal formalism" generally begins by determining the statistical densities over a range of scale lengths by one means or another including wavelet transformations across wavelength scale (Arneodo et al, 1988). These densities by scale are then systematically raised to a range of q exponents. Since q, and therefore D_q, can vary continuously, functions are created that shows how D_q varies with q. These are then further transformed, resulting in a single maximum parabolic curve whose shape and size is sensitive to the conditions of the experiment (Halsey et al, 1986). Generalized dimensions decrease as q increases. A unique neuropsychopharmacological application of the multifractal technique to a study of the behavioral influence of increasing amounts of cocaine on the time-dependent patterns of spatial exploration, temporal-spatial fluctuations, in rats, demonstrated a global splitting in the parabolic distribution suggestive of a cocaine-induced global phase transition, not unlike the well-known, dose-dependent, amphetamine-induced

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shift from hyperactivity to motor stereotypy (Paulus et al, 1991). Studies that followed demonstrated that "q-moment" distributions of heterogeneous scaling exponents and their relative statistical weightings were useful in making subtle discriminations between effects of psychopharmacological agents and behavioral (isolation) influences on animal behavior as well as patterns of simple psychomotor behavior in normal subjects and schizophrenic patients (Paulus et al, 1994; 1996; 1998; Krebs-Thomson et al, 1998a; 1998b).

Fractal Scaling Measures on Reconstructed Time Series from Biological Dynamics

Publications involving the applications of various D measures, particularly D_2, to brain-relevant times series number in the hundreds and are growing exponentially. The following constitutes a brief review of a representative set of empirical findings. In doing so, for the reasons discussed below, we ignore what some might consider the rather abstract and philosophical issue of "determinism" versus "randomness" or "error" (Sugihara and May, 1990; Casdagli, 1991; Wayland et al, 1993; Kaplan and Glass, 1992; Kaplan, 1994) since this question is relatively unproductive with respect to generating new neurobiological insights, novel experiments or new quantitative approaches to brain dynamics. In addition, as noted in the final section, this discrimination may not even have definitive theoretical meaning in that the conduct of much of the rigorous mathematics about "deterministic dynamical systems" involve Markoff partitions and matrices which are also the generic operators of formal probability theory (Sullivan, 1979; Kolmogorov, 1950). For example, N-dimensional non-linear Markoff processes can be shown to capture the dynamics of multidimensional neurobiological processes such as the EEG (Silipo et al, 1998).

We have also ignored the related issue of the presence or absence of "low dimensional structure" (Theiler and Rapp, 1996; Rapp, 1995) which, from the authors' point of view, resulted from an unfortunately concrete interpretation of the word "dimensions." With respect to experimental brain data, dimensions are defined

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most relevantly by their computational procedures and what are computed are empirical scaling exponents describing real observables as limited by the precision of the observations, their resolution and series lengths (Smith, 1988; Eckmann and Ruelle, 1992). The "correlation integral," the probability that two vectors chosen at random from the phase space reconstruction lie within "r" distance of each other, not unrelated to the phase randomization controlled, D_2 measure, yields statements about amount of "nonlinearity" (not accountable by the linear regressively capturable component of the power spectrum), which are also difficult to translate into experimentally or theoretically useful concepts (Casdagli et al, 1997). These efforts contrast with a more direct attempt to establish a spiking neuron system's dynamical "dimension" using trial and error prediction in which "dimension" was defined as the number of potentially physiologically relevant variables required to make the predictive equations fit (Segundo et al, 1998).

Computations of scaling exponent descriptors of orbital point distributions on reconstructed attractors of the brain sciences have proven to be most useful as atheoretical, empirical techniques discriminating experimental, clinical and/or treatment conditions with various approaches to statistical significance. In this regard, one can say that D_2 is often found to be superior to central tendency oriented statistics in making these discriminations. Dimension and correlation integral descriptors appear least useful when dealing with global issues such as chaos, randomness, linearity and the "underlying dimensions" of (unknown) differential equations. We discuss below the possibility that the failure to find chaos in the more recent EEG studies (Theiler and Rapp, 1996; Prichard et al, 1996) may be because the EEG attractor is better characterized as a "strange nonchaotic atttractor" with orbital patterns manifesting fractional scaling exponents but no $\overline{\lambda}(+)$ (Grebogi et al, 1984; Mandell and Selz, 1993).

The relatively subtle influence of high altitude (Mt. Everest) oxygen concentrations was not seen in the central moments of the cardiac interbeat intervals, but the D_2 of the attactor was reduced significantly (Yamamoto et al, 1993). The latencies and amplitudes of the visual evoked potential failed to

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discriminate normal subjects from those with early glaucoma, but the reconstructed attractor of the steady state visual cortical response to full field flicker demonstrated a statistically significant decrease in D_2 (Schmeisser et al, 1993). Marginal qualitative differences in optokinetic nystagmus were quantitatively significant when studied as the D_2 of the attractor's points in patients with vertigo compared with controls (Aasen et al, 1997). Reconstructions of maximum velocity waves from Doppler studies of middle cerebral artery hemodynamics (using phase random "controls") demonstrated an increase in D_2 (and a decrease in $\overline{\lambda}(+)$ correlated with age in an adult population (Keuner et al, 1996; Vliegen et al, 1996). D_2 served as a sensitive descriptor of functional changes in the EMG from the surface of the biceps muscle, increasing with muscle load and rate of flexion and extension and decreasing with muscle fatigue (Rapp et al, 1993; Nieminen and Takala, 1996; Gupta et al, 1997), suggesting its use in suspected early myotonic dystrophies and myasthenias. Reconstructed time series of stomatognathic motions in high school students with temporomandipular joint syndromes compared with those with malocclusion revealed a specific decrease in D_0 in the plane of horizontal motion in the former (Morinushi et al, 1998). Time series of plasma growth hormone levels in acromegalic patients with functioning pituitary adenomas manifested a statistically significant increase in D_0 when compared with age-matched controls (Mandell and Selz, 1997) which corresponded nicely to the reduction in "approximate entropy" (Pincus, 1991a) computed on this same data set (Hartman et al, 1994). On the other hand, comparative in vitro studies of growth hormone release patterns in normal rat pituitary cells and their neoplastically transformed relatives, the GH3 strain, demonstrate a decrease in D_0 in the latter (Guillemin et al, 1983; Mandell, 1986).

The number of examples of the use of D_2 on orbital point geometries in explorations of physiological and pharmacological regulation are increasing. The D_2 of respiratory rhythms is higher with intact vagal afferents than without (Sammon and Bruce, 1991). Histamine induced an increase in D_2 in the attractor point distribution of rabbit ear artery vasomotion, attributed to calcium-activated membrane potassium channels in that TEA prevented and reversed the change

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(Edwards and Griffith, 1997). The role of central and autonomic innervation in cardiac interval dynamics has been explored using D_2 in various ways. For examples, the transplanted heart rhythm in man has a lower D_2 than that of the normal heart (Guzzetti et al, 1996) and general anesthesia and cholinergic (but not β-adrenergic) blockade decreased multisystem D_2 in a series of multiparameter (respiration, mean blood pressure and heart rate) studies in piglets (Zwiener et al, 1996; Hoyer et al, 1998).

The activities of single and aggregates of neurons are being described and differentiated by the D_2 of their interevent interval attractors. Early and important studies related to both neuronal and field electrical activity indicated their promise (Rapp et al, 1985; Zimmerman and Rapp, 1991). The olefactory bulb demonstrated spatially uniform scaling dimensions that changed with event-related perturbation (Skinner et al, 1990). An iron-induced spiking focus in the rat hippocampus in vivo manifested the same decrease in D_2 as it did in the kindled in vitro hippocampal slice (Koch et al, 1992). D_2 also differentiated among characteristic single unit time series in norepinephrine, dopamine and serotonin neurons (Selz and Mandell, 1991) and among A8, A9 and A10 dopamine neurons (Selz and Mandell, 1992). Attractors reconstructed from single unit interspike intervals in the substantia nigra pars compacta and the auditory thalamus manifested discriminatable values for D_2 in neurons recorded by the same electrode (Celletti and Villa, 1996) and changes in state manifested in patterns of subthreshold oscillations in single neurons in the inferioir olivary nucleus could be characterized using this index (Makarenko and Llinas, 1998).

D_2 reliably discriminated between states of arousal and between the multiparameter (eye movements, neck muscle tone, EEG stage) defined EEG stages of sleep (Bablyoyantz, 1986; Rapp et al, 1989; Ehlers et al, 1991) with non-REM having a lower D_2 than REM. D_2 of the EEG record was selectively reduced in Stage II and REM in schizophrenic patients compared with controls (Roschke and Aldenhoff, 1993), this difference was made more prominent by treatment with the aminodiazopoxide, lorazepam (Roschke and Aldenhoff, 1992). In the waking state,

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higher EEG D_2 values were frontal in schizophrenic patients and more central in controls (Elbert et al, 1992). The D_2 computed on the EEG during Stage IV ("delta") sleep was sensitive to acute sleep deprivation and recovery, but demonstrated compensation (Cerf et al, 1996). Non-alcholic children of alcoholic parents manifested lower values for D_1 in their EEG attractors than the children of a normal control group (Ehlers et al, 1995). Higher I.Q. correlated with EEG D_2 in most leads in the resting state but not during a visual imagery task (Lutzenberger et al, 1992). These differences also correlated with individual differences in task performance in a perceptual pattern predictive task (Gregson et al, 1990) and with a working memory task load with regional differences most marked in the right fronto-temporal cortex (Sammer, 1996).

Peripheral nerve stimulation in the earlobe and trapezius muscle induced increments in D_2 in the EEG of specific brain regions (Heffernan, 1996). Memory for but not induced pain increased EEG D_2 in chronic pain patients but not in normal controls (Lutzenberger et al, 1997). Using contingent reinforcement of brain wave modes by hypothalamic, but not cerebral hemispheric, stimulation reduced D_2 in the EEG (Mogilevskii et al, 1998) resembling the changes accompanying defensive reflex conditioning in the rabbit between the early and late stages of the process (Efremova and Kulikov, 1997). Difficult to diagnose "periodic lateralized epileptiform discharge" syndromes have apparently yielded to D_2 computations (Stam et al, 1998). In equally problematic "atypical seizure" syndromes in children, D_2 computed on the autocovariance functions of 200 Hz digitized EEG records from multiple channels demonstrated characteristic changes (Yaylali et al, 1996).

Unlike computing a reliable leading $\overline{\lambda}(+)$ on a point set of a time series reconstruction denoting the "sensitivity to initial conditions" requirement for the diagnosis of chaos (and a potential for change such that a decrease in the positivity of $\overline{\lambda}(+) \rightarrow \overline{\lambda}(0)$ may auger a nearby bifurcation), the presence of a fractional scaling exponent, D_i, does not in and of itself implicate a chaotic dynamical state. A nice example of a nonchaotic dynamic with $\overline{\lambda} = 0$ that has a fractional scaling exponent, D = 0.538, is the "Feigenbaum" point where the above noted "infinite" series of

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period doubling bifurcations accumulate (Grassberger, 1981). This is a dust-like region, which when endlessly dilated looks like the same dust. Some mathematicians call these objects "Lebesgue points" because even though at low magnifications when they look rather solid, they are not. Composed of points, they have topological measure zero (a line has measure one) and non-integer fractal dimension. These $\overline{\lambda} = 0$, D $\neq$ Integer, period doubling accumulation points can be found in a wide variety of attractors, though in each case the parameter space in which they are located is so small (in point set topology also called "Lebesgue measure zero") that they are very difficult to locate and therefore have little chance of being physiologically significant.

This constrasts with a relatively new category of dynamical systems which promises to be important in studies of the nervous system. These are ones that are driven by two or more independent frequencies (called quasiperiodic driving). We found them to be relevant to brain stem, thalamocortical neurophysiology of perceptual processes and states of consciousness. They have the properties, $\overline{\lambda} = 0$, D_0 and $D_1 \neq$ integer and a characteristic scaling "spectral distribution function" (see below). They have been named "strange nonchaotic attractors" (Grebogi et al, 1984; Romeiras et al, 1987; Ding et al, 1989). In addition, the strange nonchaotic behavior of these quasiperiodically-driven, nonlinear oscillators has positive (>0) measure in parameter space and thus is of potential physiological significance. A good demonstration of a multiple frequency driven strange nonchaotic attractor can be found and manipulated in the software package of Nusse and Yorke (1991).

The neurobiological substrate for this system is the brain stem neuronal modulatory driving of on- going thalamocortcal oscillatory brain waves (once called "recruitment waves" in the 7-14 Hz, θ to α, day dreaming to quiet alert range) and as perturbed by multifrequency driving in what was once called "reticular formation arousal" are realized as dominant EEG modes and associated states of perceptual acuity and consciousness (Moruzzi and Magoun 1949; Moruzzi, 1960; Klemm, 1990; Steriade and McCarley, 1990; Contreras et al, 1997). In addition to intrinsic

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multiply periodic and aperiodic oscillations of thalamic and cortical cells and their recursive, feedback coupling, the brain stem manifests more than two orders of magnitude of "independent" neuronal driving frequencies ranging from serotonin discharges at 1 Hz, cortically direct dopamine and norepinephrine neurons in the 10-50Hz range and mesencephalic reticular neurons discharging as fast as 100 to 200 Hz. The "thalamocortical brain wave oscillator" as their target has been a fixture in global state neurophysiology since the 1940's and 1950's and is of great current interest (Fessard et al, 1961; Bazhenov et al, 1998). We have explored the relationships between strange nonchaotic dynamics and brain-stem neuronal and thalamocortical physiology from the standpoint of neuronal coding and the properties of the EEG attractor. (Mandell et al, 1991; Mandell and Kelso, 1991; Mandell and Selz, 1992; 1993;1994;1997a). We found that the EEG attractor could be characterized by the diagnostic triad identifying strange nonchaotic attractors: $\overline{\lambda} = 0$, D_0 and $D_1 \neq$ Integer, and a signatory power spectral distribution in which the number of peaks, N, with amplitudes greater than ϖ, $N(\varpi)$, went as $\varpi^{-\alpha}$, $1 < \alpha < 2$ (Romeiras et al, 1987; Mandell et al, 1991). In addition to being consistent with known multifrequency, brain stem driving of thalamocortical oscillations, the EEG as a strange, nonchaotic attractor is intuitively appealing in that it has the necessary mechanisms for the power law scaling of a wide range of characteristic times (D_0 and $D_1 \neq$ Integer) from picosecond fluctuations of neural membrane proteins to the decades of bipolar phenomena and since $\overline{\lambda} = 0$, the orbital points don't tend to "mix"(get out of order) on the attractor, thus protecting the fidelity of sequence dependent brain information transport (Berns and Sejnowski, 1998).

Entropies, Unstable Periodic Orbits and Shadowing; Short Time Series Can Discriminate Experimental Conditions in Studies of Biological Dynamics

We avoid the temptation to deal with the deep analogy between thermodynamic entropy (Clausius, 1897) and information theoretic entropy (Shannon and Weaver, 1949), constraining our discussion to the context of an operational equivalence (in healthy systems) between gain of information and

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decrease in entropy in brain-relevant dynamical systems. As we shall see, certain pathophysiological processes appear to manifest themselves as reductions in background or "resting" state entropy which then limits its supply with respect to information gain and/or transport. Relationships between "physical" thermodynamic observables, such as changes in heat capacity or temperature dependence of kinetic constants, and information-transport driven, neurotransmitter evoked conformational changes in neural membrane proteins may someday come together in an experimentally productive way (Hitzemann et al, 1985; Zeman et al, 1987; Borea et al, 1988), but they are beyond the scope of this paper.

The idea of taming the orbit of an expanding flow (with at least one $\bar{\lambda}(+)$) by partitioning the geometric space supporting its actions, its "manifold," and then labeling each box so that its trajectory is representable by a symbol string of box indices is the way "symbolic dynamics" are applied to dynamical systems. Symbolic dynamics arose in pure mathematics in the context of obtaining a one-to-one, topological (sequence not distance preserving) representation of a difficult to characterize system of "geodesics on surfaces of negative curvature" (Hadamard, 1898; Morse, 1917; Morse and Hedlund, 1938). Geodesics here are the shortest lines in this curved, non-Euclidean space in which nearby lines spread apart and far away ones came together with (in Euclidian space) parallel lines meeting at infinity.

Remarkably, symbolic dynamic encoding of the motions on this abstract manifold of negative curvature also capture how uniformly divergent (and convergent), "hyperbolic" chaotic systems, such as brain systems, behave in Euclidean space, an intuitive similarity about which Poincare experienced his famous vacation bus trip epiphany (Stillwell, 1985). It should also be noted that encoding neural spike trains in one dimension for symbolic dynamical comparisons of sequence structure and recurrances, "favored patterns" has been developed independently of orbital dynamics on manifolds (Dayhoff, 1984; Dayhoff and Gerstein, 1983a; 1983b). A similar approach has been used to characterize firing patterns and their response to acupuncture in dopamine neurons in the substantia nigra and hypothalamic neurons (Chen and Ku, 1992).

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For real neurobiological data, a time series and its n time delays are first reconstructed as a trajectory in an n+1 dimensional geometric embedding space and, following partition of that geometric space into n+1 dimensional lettered boxes (the choice of partition being a sensitive step), what was once an orbit has become a sequence of symbols. Dynamical systems in geometric space become symbolic dynamics in sequence space. It was Kolmogoroff (1958) who first applied Shannon's ideas of entropy and information (Shannon and Weaver, 1949; Khinchin, 1957) to the quantification of these dynamical system's telegraphic messages as discrete, "stochastic" (random, probabilistic) output. Kolmogoroff turned to Shannon entropy, $-\sum p_i \log p_i$ (where p = 1/n and n = number of possibilities) to decide the question whether a dynamical system that naturally partitioned into a two or three box system per unit time had the same entropy. His answer was no, that –3(1/3 ln (1/3)) = 1.098 > -2(1/2 ln (1/2) = 0.6931 $\log_e$ and in computer relevant $\log_2$, 1.5850 > 1.0 (Kolmogorov, 1959). Entropy increases with possibility.

Nonlinear differential equations representing brain-relevant expanding dynamical systems replace Shannon's linguistically weighted and serially ordered, Markoff-dependent random number generator of probabilistic language. As noted above, in the case of the Sharkovskii sequences (Sharkovskii, 1964; Metropolis et al, 1973; Misiurewicz, 1995), a small change in the single parameter of an entire class of single maximum maps generating motions that are coded from their position at the left or right of center of the unit interval, alters and determines precisely the periodic output such as {1,0,0,1,0,1,1,0,0,1,0,1...) of its binary message. In higher dimensional examples such as the Rössler and Lorenz systems, one can visualize the joint actions of $\overline{\lambda}(+)$ and $\overline{\lambda}(-)$ moving the trajectory so as to both enter, "create," new boxes and generate new letters as well as visit old ones, unstable fixed points, thus forming unstable periodic orbits. The latter, one of three diagnostic features of chaotic attractors (see above), can also be seen as resulting from the "coarse-grained" imprecision of real world neurobiological measurement such that two points that are brought close to attractive-repelling points are, within measurement error, recorded as having the same value.

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Problems of measurement precision, amplified by the expansive actions of systems that are sensitive to initial conditions, yield parameter sensitive entropies of two (mathematically) fundamental kinds called topological and metric entropies, h_T and h_M, proven to be the upper and lower bounds of any estimate of the entropy in a uniformly expanding and/or equidistributed system (Adler and Weiss, 1965). Measures of entropy, as "missing information related to the number of alternatives which remain possible to a physical system" (Boltzmann, 1909), "index of probability" (Gibbs, 1902) or the "amount of uncertainty associated with a finite scheme" (Khinchin,1957) are obviously sensitive to the partition rules and its fineness of the grain. The most theoretically defensible partition is called the "generating partition" in which no box contains more than one point. Comparisons of control and experimental data can be differentially sensitive to partition construction, so that if a generating partition is not practicable due to sample length or dense curdling in the point distribution, some arbitrary choices have to be made. These have included naturally renormalized variational partitions, such that in one dimension the boxes are defined by ± 1, ± 2, ± 3,...standard deviations, or quartiles or quintile, above and below the mean and in n dimensions. Partitions have also been constructed and used to described drug effects on rat exploratory behavior by sequential partitioning along the dimension of the highest remaining variation (after the previous partition) called the "KD" partition (Paulus et al, 1991). Partition strategies to capture entropic measures on serial ordering (Klemm and Sherry, 1981; Strong et al, 1998) can grow from knowledge or hypotheses about the physiological sources of temporal irregularities and discontinuities in brain dynamics including characteristic interval(s) of refractoriness, relaxation times of the inhibitory surround, correlation time in dendritic tree summation, the time course of reciprocal inhibition and its decay and chemical influences such as the synaptic half-life and time of action of inhibitory influences such as GABA on cell firing.

The logarithmic growth rates of occupancy of new symbolically indexed boxes or, equivalently, the growth rates of visitations to old ones generating unstable periodic orbits, are called topological entropies, h_T . They record new happenings, the growth rate of the diversity of orbits, and not how likely with respect

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to box occupancy densities they are likely to occur (Adler et al, 1964; Alexeev and Jacobson, 1981; Cornfield et al, 1982; Ornstein, 1989; Ruelle, 1990). The close relationships in real brain observables between the appearance rate of new symbols or new unstable periodic orbits, h_T , and log $\overline{\lambda}(+)$, reflecting the rate of divergence from the next expected value generating a new, unexpected value, is not surprising. In fact, a maximal estimate of the entropy of a dynamical system, h_T = log $\overline{\lambda}(+)$ whereas the largest value that h_M can attain is log(#of states). A great deal of substantial mathematics has gone into proofs that similarities ("equivalence relations") and differences between dynamical patterns are robustly indicated by differences in h_T and h_M (Adler et al, 1977; Adler and Marcus, 1979).

If the sum of the densities in each j box were normalized so as to sum to 1.0, such that each is a probability, p_j , then - Σ p_j log p_j represents the metric entropy, h_M. h_M was first described in the dynamical context by Kolmogorov (1958;1959). The sum having a –1 prefactor converts the negative log of < 1 to a meaningful positive value in the expression. h_M is maximal for the equidistributed, uniformly expansive, C or Axiom A systems (see above). As noted above, generally h_T = the maximum estimate of the entropy and h_M the minimum estimate (Adler and Weiss, 1965). $h_T = h_M$ in uniformly hyperbolic systems (Bowen, 1975) and the difference, $|h_T - h_M|$ is an index of non-uniformity found useful in discriminating among classes of single neurons from their discharge patterns (Mandell, 1987; Selz and Mandell, 1992; Mandell and Selz, 1993; Mandell and Selz, 1997a). These measures applied to temporal and spatial patterns of rat exploratory behavior have been used to discriminate among stimulant drug effects (Paulus et al, 1990; Paulus and Geyer, 1992). Similar computations involving the symbolic dynamics and disallowed transitions have been used to study the complexity of the the EEG (Xu, 1994) in which both extremely low (fixed point, periodic) and high (Gaussian random) entropies are seen as manifesting low "complexity as a function of the diversity of the available patterns of behavior (Crutchfield and Young, 1989a).

Before describing the simple but definitional matrix operations for h_T and h_M below which might seem forbidding to those "not up on their linear algebra," we note

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that procedures such exponentiation of a matrix can be carried out automatically using computer algebra programs such as Maple or for data processing available as computational modules in MatLab.

One of the techniques for the computation of h_T involves determining the logarithm of the asymptotic growth rate of the major diagonal ("trace") in the transition matrix symbolically encoding the trajectory which would therefore count the "self visitations" of each indexed boxes as the dynamics proceed. This involves setting up a transition incidence matrix, each box scored for a disallowed, 0, or allowed, 1, transitions and the matrix is exponentiated t times with the logarithm of the asymptotic growth rate of the sum of the diagonal values serving as a (leading eigenvalue) estimate of h_T. More technical considerations involving the Frobenius-Perron theorem guaranteeing the existence of such an logarithmic index of new information generation rates, even in random matrices (Seneta, 1981), will not be discussed here.

We have found that computing h_T in this way is empirically useful for difficult to obtain or only transiently stationary brain data series. Even with relatively short samples lengths, if one is willing to make the pragmatic assumption of "temporary stationarity" or "things as they are right now will, for the sake of argument, go on forever" (perhaps the best we can do with intrinsically transient brain phenomena) then this "freeze framed" representation of reality yields an asymptotic measure on relatively short sample lengths since they are computationally infinite. A similar approach to h_M, requires repeatedly exponentiating a Markoff matrix constructed from relatively short samples and generates the probabilistic (eigenvector) "dual" of h_T. h_M computed in this way serves as a useful quantity, h_M called by some the Kolmogorov entropy in comparisons of control and experimental conditions of the same sample lengths. Systematic decreases in h_M ("Kolmogorov entropy") have been shown to accompany increasing "depth" of sleep using standard sleep staging techniques (Gallez and Babloyantz, 1991) and increases in h_M were associated with both positive and negative emotional states induced by movies (Aftanas et al, 1997).

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h_T and $\overline{\lambda}(+)$ have been analogized to what is called algorithmic complexity, which quantifies a computer algorithm's minimal representation of a symbol sequence as it grows longer (Chaitin, 1974; Bennett, C.H., 1982; Nicolis, 1986; Rissanen, 1982; Crutchfield and Young, 1989b). Examples of applications of a pseudocomputational compression scheme have quantified differences among protein sequences (Ebling and Jimenez-Montano, 1980), discriminated therapist-directed "transference" manifestations in verbally encoded processes in psychotherapy (Rapp et al, 1991), characterized neural spike train patterns in a penicillin kindled spike focus (Rapp et al, 1994), differentiated among spike sequence patterns of biogenic amine families of brain stem neurons (Mandell and Selz, 1994) and as a sample length-dependent rate, in content-free, mouse driven computer tasks differentiated borderline from obsessive-compulsive personality patterns (Selz and Mandell, 1997).

Computation of lexical complexity is a good example of this approach. This procedure recursively surveys the sequence of symbols for the longest word, where "words" are subsequences that appear at least three times if they contain two letters or at least twice if they contain more than two letters. Upon finding a longest repeated word, the compression algorithm replaces all occurances of this word with a single distinct (new) symbol and looks again for the longest repeated word in the modified sequence. When the sequence cannot be further recursively compressed, there may remain identical adjacent symbols in the sequence. These are coded as the symbol raised to the power of the number of its adjacent occurances. This exponent cannot exceed five because six adjacent identical symbols would be two occurances of a three letter word. The numerical value of the lexical complexity is simply the sum of the number of distinct symbols and the (sum of the) logarithm of the exponents of the symbol sequences (Ebling and Jimenez-Montano, 1980).

A clear account of algorithmic and lexical complexity in relationship to other measures of "complexity" in the context of brain relevant research data can be found in Rapp and Schmah (1996). The relationship between thermodynamic and ergodic, measure theories in relationship to forced-dissipative dynamics and the

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role of self-intersection on manifolds in this new source of irreversibility (with a resulting "arrow of time") is developed in Mackey (1992).

As noted, the skeleton which configures attractors is composed of unstable, "saddle" fixed points, each of which attract (iron down) the trajectory along one dimension and repel or spread it out along another. Systems fulfilling the criteria for a chaotic dynamical system have the property of a countably infinite number of unstable periodic orbits composed of these unstable fixed points. Depending upon parameters, the orbital points can pull up their tails to be discrete with respect to each other or spread along the unstable direction to connect smoothly with others along a curve such as a saddle cycle. Parametric control of the strengths and structures of the saddle point skeleton of typical attractors can be used to change both the rate of generation of novel symbols as well as recurrances to old ones in the symbolic dynamics generating a brain dynamical system's lexagraphic products (Bowen, 1978; Alexeev and Jacobson, 1981)).

Using a variety of techniques to algorithmically register "return times," experimental condition-sensitive "saddle orbits" composing unstable periodic orbits have been demonstrated in geometric reconstructions of real data series generated by a 40+ component chemical reaction (Lathrop and Kostelich, 1989), in response to natural stimuli in the time dependent behavior of the crayfish caudal photoreceptor (Pei and Moss, 1996) and in the interburst interval sequences recorded in hippocampal slices of the rat (So et al, 1997; So et al, 1998). If the reader uses the software listed above to simulate the time evolution of one of these attractors of abstract or real systems , she will learn that a remarkably small number of points, a very short time sample, will outline, "shadow" (Bowen, 1978), the complete array of unstable fixed points before filling in the attractor. It is tempting to speculate about the potential nervous system relevance of this dynamical anticipation of the attractor's recognizable geometry, as well as a precis of what the symbolic dynamics are going to say occurs many time steps before filling in the attractor and its asymptotic message. Values of the measures made on the early unstable periodic orbit arrays such h_T , h_M and $\overline{\lambda}(+)$, resemble very closely those

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made on their attractors when they were much more densely filled (Lathrop and Kostelich , 1989). Bowen's "shadow lemma" in support of a thin film of points over the skelton of unstable fixed points of attractors is the fundamental reason that short sample length time series can often discriminate between control and experimental conditions in brain research studies.

Another recently implemented entropy, called "approximate entropy," is exploiting the underlying unstable fixed point skeletal shadowing principle in expansive dynamical systems to find statistically significant differences between control and experimental results in reasonably short, physiologically realistic, sample lengths (Pincus, 1991; Pincus et al, 1991). This algorithm is somewhat derivative of those involved in the computation of the correlation dimension (see above). Instead of computing across a range (and taking the limits) of embedding dimensions, d, and sequential paired-vectorial distances, ε, it empirically tailors and fixes them to compute a "logarithmic likelihood" that points remains close through incremental change in the time series. The "approximate entropy" is not easily relatable to either h_T and h_M. One is tempted to predict that this geometrically oriented algorithm might be fooled into a postive entropy diagnosis if applied to strange, nonchaotic dynamical systems with fractal dimension but no $\overline{\lambda}(+)$-related mixing. Since sequence position is conserved in this computation, two simultaneously studied ("multiparameter") systems can be examined for their mutual coherence as the "cross approximate entropy." Among the interesting findings from applications of this index to neuroendocrine studies are an increase in approximate entropy in LH and FSH secretory patterns with age in both sexes, perhaps quantitatively heralding menopause (Pincus and Minkin, 1998) and decreased cross approximate entropy, a decrease in regulatory coupling between ACTH and cortisol secretion patterns in patients with Cushing's syndrome (Roelfsema et al, 1998).

Among the many of other empirically derived entropies, one is called "power spectral entropy," which is equivalent to the normalized variance of the distribution of frequencies in a power spectral transformation of a time series (Farmer et al, 1980). This has been successfully applied to brain enzyme and receptor fluctuations

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(Russo and Mandell, 1984a; Mandell, 1984), and, more recently, to multiple simultaneously EEG leads which demonstrated focal increases in epileptic patients (Inouye et al, 1991; 1992). An entropy derived from the quantification of the failures in temporal forecasting of EEG signals increased in the fronto-temporal region with drug treatment in patients with Alzheimer's syndrome (Pezard et al, 1998).

With respect to their implications for the clinical neurosciences, changes in dynamical entropy in behavior of brain dynamical systems has been regarded in two general ways: (1) Since representation of information requires the resolution of relevant ambiguity, a nonrelevant and global reduction in the dynamical entropy of a brain system (Stage IV sleep EEG slow waves, neuronal fixed point or regularly periodic activity, extrapyramidal motor tremor, fixed paranoid or obsessional mentation, the actions of some anxiolytics and antipsychotics) reduces its potential for information encoding and transport. In contrast, "arousal" induced increases in the measures of entropy in brain wave and neuronal discharge patterns (pre-task warning signals, motivating conditions, stimulant drugs) are associated with improved psychophysical receptive and discrimination functions, learning rates and memory. (2) Regarding as potentially pathophysiological both of the two extremes of entropy generation, fixed point and periodic behavior as the lowest and fair coin flipping, "Bernoulli" randomness as the highest, another descriptor, "complexity" is defined as maximal (optimal) midway through the entropy range, making a new kind of parabolic entropy curve (Bennett, 1986; Crutchfield and Young, 1989a).

In analogy with an optimal amalgam of periodic rotations and coin flips, in higher dimension, the most meaningful maximum complexity of real, nonuniformly expansive processes may derive from a multiplicity of measure invariants, symmetries, of the system such as the growth rate of unstable periodic orbits, divergence of the tail of a density distribution and specifiable linguistic variables such as word length and redundancy. The more symmetries, the more potential for complicated information encoding and transport with the maximum complexity located midrange in each one. We have pursued the hypothesis that entropy is a conserved property in the healthy brain and that complementarity in other statistical measure mechanisms make that possible. For example, in uniformly expansive,

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idealized systems, topological entropy has been proven be equivalent to the product of an index of expansion and the dimension of the support such that an increase in expansiveness , $\overline{\lambda}(+)$, is compensated by a decrease in D_0 leaving h_T invariant (Manning,1981). This relationship has also been found in the behavior of some nonuniformly expansive neuroendocrine, neuronal and human behavioral systems (Mandell and Selz, 1995; Smotherman et al, 1996; Mandell and Selz, 1997a;).

Is Randomness Versus Determinism a Productive Question for the Biological Sciences? Are There Better Ones?

Measures made on realistically nonuniformly expansive behavior of dynamical systems emerging from nonlinear differential equations and that arising from a variety of non-classical random walk models overlap such that making what may be more a metaphysical discrimination at this point is labor intensive, contentious and unproductive for generating new experimental work in the neurosciences. It is important to note that random walk theory and computation has matured to such an extent that almost any "nonlinear dynamical behavior" can, with respect to statistical measure, be modeled using one of many varieties. For examples, power law distributions in continuous time random walks (times of movement are also randomly chosen) , random walks with traps (temporarily immobilizing the trajectory like unstable fixed points), random walks in random environments, time of passage of ants in a labyrinth and Levy leaps and local diffusive exploration (looking for a wallet) among many others can represent much of the irregular behavior we observe in the brain (Shlesinger et al, 1982; Montroll and Shlesinger, 1984; Hughes, 1995; Klafter et al, 1996). On the other hand, (Markoff) partition of the sequence and a probabilistic style of analysis of nonlinear dynamical systems has been a major strategy for description and quantification from the field's beginnings (Parry, 1964; Adler and Weiss, 1967; Bowen, 1970; Lasota and Yorke, 1973). The issue of randomness versus determinism remains current although many if not most properties of deterministic dynamical systems can

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be simulated with a suitably constructed random process and all of our random number generators are deterministic.

This theoretical blind alley is reminiscent of the decades lost partialing out causal attributes of nature versus nurture before knowledge of dynamical influences on nucleotide dynamics was available. It is perhaps unfortunate that for finite length real data, "house keeping requirements" (Ruelle, 1990; Rapp, 1993;1994) and "warnings on the label" with various random sequence, random phase controls ("surrogate data") have become so intimidating to those of us in the early stages of exploring the use of these theories and methods in the brain sciences. Currently the "controls" are more relevant to abstract statistical processes and what can be said about them rather than generating and addressing new claims and the controls for them related to quantitatively oriented, experimental brain physiology.

Statistical caveats have arisen to retard the emergence of potentially important and robust neurophysiologically-relevant phenomena. For example, a recent well conducted and analyzed study of the influence of low doses of ethanol in 32 normal male subjects, which honored almost all of the current analytic rituals including sequence and phase randomized surrogate data and searches for the continuity features of deterministic dynamical systems such as time asymmetry, concluded that the drug "reduced the evidence for nonlinear dynamical structure" in the brain (Ehlers et al, 1998). Though honoring the currently popular statistical rituals, what appears to be missing here are suggestions for new neurobiological or mathematical intuitions that will lead to the design of the next experiment.

We now see that it is now possible to use these new ideas and methods to ask and at least partially answer more specific questions relevant to the clinically oriented neurosciences such as: whether increases in lithium-induced expansiveness and mixing in the dynamics of brain enzymes, neurons and behavior help explicate a mechanism of de-coherence in bipolar disease (Mandell et al, 1985); do these approaches to membrane conductance fluctuations suggest a new way to think about ion channel dynamics (Liebovitch, 1990); can alcohol-induced changes in statistical dynamics of the EEG predict genetic predilection in males to

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alcoholism (Ehlers et al, 1995); do these approaches suggest a new neural dynamical mechanism for the actions of anticonvulsant drugs (Zimmerman et al, 1991); can these measures made on non-verbal, psychomotor tasks yield a non-intrusive measure of personality and character (Selz, 1992); can these approaches to deviant patterns of psychomotor sequencing in schizophrenics give us some insight into potential (cerebeller-basal ganglia?) mechanisms of the thought disorder in schizophrenia (Paulus et al, 1994); does cocaine induce new patterns of behavior that conserve pre-treatment entropy in developing animals (Smotherman et al, 1996); will these quantities applied to objective gait observables supply early diagnoses and quantification of clinical course in patients with extra-pyramidal disorders or taking anti-psychotic medication (Hausdorff et al, 1998); can these transformations of time series on the EEG give us an early diagnostic approach to Alzheimer's disease (Jeong et al, 1998) or a new acute preventive pharmacological approach to patients with psychomotor and partial seizures (Iasemidis et al, 1990).

To end where we began: We think that if neuroscientists "did their own" nonlinear dynamical theory and analysis, shaped and tailored by intuitions growing out of their own experimental work and thinking, abstract and philosophical questions about what is determinism and what is random would retreat in favor of new specific ideas and experiments about brain dynamical mechanisms and their pathophysiology. From the studies reviewed here, it appears that a robust move in this direction in the brain sciences is well underway.

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PRAISE FOR

The 4-Hour Workweek

"It's about time this book was written. It is a long-overdue manifesto for the mobile lifestyle, and Tim Ferriss is the ideal ambassador. This will be huge."

—**JACK CANFIELD**, cocreator of *Chicken Soup for the Soul®*, 100+ million copies sold

"Stunning and amazing. From mini-retirements to outsourcing your life, it's all here. Whether you're a wage slave or a Fortune 500 CEO, this book will change your life!"

—**PHIL TOWN**, *New York Times* bestselling author of *Rule #1*

"The 4-Hour Workweek is a new way of solving a very old problem: just how can we work to live and prevent our lives from being all about work? A world of infinite options awaits those who would read this book and be inspired by it!"

—**MICHAEL E. GERBER**, founder and chairman of E-Myth Worldwide and the world's #1 small business guru

"This is a whole new ball game. Highly recommended."

—**DR. STEWART D. FRIEDMAN**, adviser to Jack Welch and former Vice President Al Gore on work/family issues and director of the Work/Life Integration Program at the Wharton School, University of Pennsylvania

"Timothy has packed more lives into his 29 years than Steve Jobs has in his 51."

—**TOM FOREMSKI**, journalist and publisher of SiliconValleyWatcher.com

"If you want to live life on your own terms, this is your blueprint."

—**MIKE MAPLES**, cofounder of Motive Communications (IPO to $260M market cap) and founding executive of Tivoli (sold to IBM for $750M)

"Thanks to Tim Ferriss, I have more time in my life to travel, spend time with family, and write book blurbs. This is a dazzling and highly useful work."

—**A. J. JACOBS**, editor-at-large of *Esquire* magazine and author of *The Know-It-All*

"Tim is Indiana Jones for the digital age. I've already used his advice to go spearfishing on remote islands and ski the best hidden slopes of Argentina. Simply put, do what he says and you can live like a millionaire."

—**ALBERT POPE**, derivatives specialist at UBS World Headquarters

"Reading this book is like putting a few zeros on your income. Tim brings lifestyle to a new level

—listen to him!"

—**MICHAEL D. KERLIN**, McKinsey & Company consultant to Bush-Clinton Katrina Fund and a J. William Fulbright Scholar

"Part scientist and part adventure hunter, Tim Ferriss has created a road map for an entirely new world. I devoured this book in one sitting—I have seen nothing like it."

—**CHARLES L. BROCK**, chairman and CEO of Brock Capital Group; former CFO, COO, and general counsel of Scholastic, Inc.; and former president of the Harvard Law School Association

"Outsourcing is no longer just for Fortune 500 companies. Small and mid-sized firms, as well as busy professionals, can outsource their work to increase their productivity and free time for more important commitments. It's time for the world to take advantage of this revolution."

—**VIVEK KULKARNI**, CEO of Brickwork India and former IT secretary of Bangalore; credited as the "techno-bureaucrat" who helped make Bangalore an IT destination in India

"Tim is the master! I should know. I followed his rags to riches path and watched him transform himself from competitive fighter to entrepreneur. He tears apart conventional assumptions until he finds a better way."

—**DAN PARTLAND**, Emmy Award–winning producer of *American High* and *Welcome to the Dollhouse*

"*The 4-Hour Workweek* is an absolute necessity for those adventurous souls who want to live life to its fullest. Buy it and read it before you sacrifice any more!"

—**JOHN LUSK**, group product manager at Microsoft World Headquarters

"If you want to live your dreams now, and not in 20 or 30 years, buy this book!"

—**LAURA RODEN**, chairman of the Silicon Valley Association of Startup Entrepreneurs and a lecturer in Corporate Finance at San Jose State University

"With this kind of time management and focus on the important things in life, people should be able to get 15 times as much done in a normal workweek."

—**TIM DRAPER**, founder of Draper Fisher Jurvetson, financiers to innovators including Hotmail, Skype, and Overture.com

"Tim has done what most people only dream of doing. I can't believe he is going to let his secrets out of the bag. This book is a must read!"

—**STEPHEN KEY**, top inventor and team designer of Teddy Ruxpin and Lazer Tag and a consultant to the television show *American Inventor*

The 4-Hour Workweek

►ESCAPE 9–5, LIVE ANYWHERE, AND JOIN THE NEW RICH

Expanded and Updated

TIMOTHY FERRISS

CROWN PUBLISHERS NEW YORK

For my parents,
DONALD AND FRANCES FERRISS,
who taught a little hellion that marching to a different drummer was a good thing. I love you both and owe you everything.

SUPPORT YOUR LOCAL TEACHER—
10% of all author royalties are donated to educational not-for-profits, including Donorschoose.org.

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Online Round-the-World (RTW) Trip Planner

ACKNOWLEDGMENTS

PREFACE TO THE EXPANDED AND UPDATED EDITION

The 4-Hour Workweek was turned down by 26 out of 27 publishers.

After it was sold, the president of one potential marketing partner, a large bookseller, e-mailed me historical bestseller statistics to make it clear—this wouldn't be a mainstream success.

So I did all I knew how to do. I wrote it with two of my closest friends in mind, speaking directly to them and their problems—problems I long had—and I focused on the unusual options that had worked for me around the world.

I certainly tried to set conditions for making a sleeper hit possible, but I knew it wasn't likely. I hoped for the best and planned for the worst.

May 2, 2007, I receive a call on my cell phone from my editor.

"Tim, you hit the list."

It was just past 5 P.M. in New York City, and I was exhausted. The book had launched five days before, and I had just finished a series of more than twenty radio interviews in succession, beginning at 6 A.M. that morning. I never planned a book tour, preferring instead to "batch" radio satellite tours into 48 hours.

"Heather, I love you, but please don't $#%* with me."

"No, you really hit the list. Congratulations, Mr. *New York Times* bestselling author!"

I leaned against the wall and slid down until I was sitting on the floor. I closed my eyes, smiled, and took a deep breath. Things were about to change.

Everything was about to change.

Lifestyle Design from Dubai to Berlin

The 4-Hour Workweek has now been sold into 35 languages. It's been on the bestseller lists for more than two years, and every month brings a new story and a new discovery.

From the *Economist* to the cover of the *New York Times Style* section, from the streets of Dubai to the cafes of Berlin, lifestyle design has cut across cultures to become a worldwide movement. The original ideas of the book have been broken apart, improved, and tested in environments and ways I never could have imagined.

So why the new edition if things are working so well? Because I knew it could be better, and there was a missing ingredient: you.

This expanded and updated edition contains more than 100 pages of new content, including the latest cutting-edge technologies, field-tested resources, and—most important—real-world success stories chosen from more than 400 pages of case studies submitted by readers.

Families and students? CEOs and professional vagabonds? Take your pick. There should be someone whose results you can duplicate. Need a template to negotiate remote work, a paid year in Argentina, perhaps? This time, it's in here.

The Experiments in Lifestyle Design blog (www.fourhourblog.com) was launched alongside the book, and within six months, it became one of the top 1,000 blogs in the world, out of more than 120 million. Thousands of readers have shared their own amazing tools and tricks, producing phenomenal and unexpected results. The blog became the laboratory I'd always wanted, and I encourage you to join us there.

The new "Best of the Blog" section includes several of the most popular posts from the Experiments in Lifestyle Design blog. On the blog itself, you can also find recommendations from everyone from Warren Buffett (seriously, I tracked him down and show you how I did it) to chess prodigy Josh Waitzkin. It's an experimental playground for those who want better results in less time.

Not "Revised"

This is not a "revised" edition in the sense that the original no longer works. The typos and small mistakes have been fixed over more than 40 printings in the U.S. This is the first major overhaul, but not for the reason you'd expect.

Things have changed dramatically since April 2007. Banks are failing, retirement and pension funds are evaporating, and jobs are being lost at record rates. Readers and skeptics alike have asked: Can the principles and techniques in the book really still work in an economic recession or depression?

Yes and yes.

In fact, questions I posed during pre-crash lectures, including "How would your priorities and

decisions change if you could never retire?" are no longer hypothetical. Millions of people have seen their savings portfolios fall 40% or more in value and are now looking for options C and D. Can they redistribute retirement throughout life to make it more affordable? Can they relocate a few months per year to a place like Costa Rica or Thailand to multiply the lifestyle output of their decreased savings? Sell their services to companies in the UK to earn in a stronger currency? The answer to all of them is, more than ever, yes.

The concept of lifestyle design as a replacement for multi-staged career planning is sound. It's more flexible and allows you to test different lifestyles without committing to a 10- or 20-year retirement plan that can fail due to market fluctuations outside of your control. People are open to exploring alternatives (and more forgiving of others who do the same), as many of the other options—the once "safe" options—have failed.

When everything and everyone is failing, what is the cost of a little experimentation outside of the norm? Most often, nothing. Flash forward to 2011; is a job interviewer asking about that unusual gap year?

"Everyone was getting laid off and I had a once-in-a-lifetime chance to travel around the world. It was incredible."

If anything, they'll ask you how to do the same. The scripts in this book still work.

Facebook and LinkedIn launched in the post-2000 dot-com "depression." Other recession-born babies include Monopoly, Apple, Cliff Bar, Scrabble, KFC, Domino's Pizza, FedEx, and Microsoft. This is no coincidence, as economic downturns produce discounted infrastructure, outstanding freelancers at bargain prices, and rock-bottom advertising deals—all impossible when everyone is optimistic.

Whether a yearlong sabbatical, a new business idea, reengineering your life within the corporate beast, or dreams you've postponed for "some day," there has never been a better time for testing the uncommon.

What's the worst that could happen?

I encourage you to remember this often-neglected question as you begin to see the infinite possibilities outside of your current comfort zone. This period of collective panic is your big chance to dabble.

It's been an honor to share the last two years with incredible readers around the world, and I hope you enjoy this new edition as much as I enjoyed putting it together.

I am, and will continue to be, a humble student of you all.

Un abrazo fuerte,

TIM FERRISS

San Franciso, California
April 21, 2009

First and Foremost

► FAQ—DOUBTERS READ THIS

Is lifestyle design for you? Chances are good that it is. Here are some of the most common doubts and fears that people have before taking the leap and joining the New Rich:

Do I have to quit or hate my job? Do I have to be a risk-taker?

No on all three counts. From using Jedi mind tricks to disappear from the office to designing businesses that finance your lifestyle, there are paths for every comfort level. How does a Fortune 500 employee explore the hidden jewels of China for a month and use technology to cover his tracks? How do you create a hands-off business that generates $80K per month with no management? It's all here.

Do I have to be a single twenty-something?

Not at all. This book is for anyone who is sick of the deferred-life plan and wants to live life large instead of postpone it. Case studies range from a Lamborghini-driving 21-year-old to a single mother who traveled the world for five months with her two children. If you're sick of the standard menu of options and prepared to enter a world of infinite options, this book is for you.

Do I have to travel? I just want more time.

No. It's just one option. The objective is to create freedom of time and place and use both however *you* want.

Do I need to be born rich?

No. My parents have never made more than $50,000 per year combined, and I've worked since age 14. I'm no Rockefeller and you needn't be either.

Do I need to be an Ivy League graduate?

Nope. Most of the role models in this book didn't go to the Harvards of the world, and some are dropouts. Top academic institutions are wonderful, but there are unrecognized benefits to not coming out of one. Grads from top schools are funneled into high-income 80-hour-per-week jobs, and 15–30 years of soul-crushing work has been accepted as the default path. How do I know? I've been there and seen the destruction. This book reverses it.

► MY STORY AND WHY YOU NEED THIS BOOK

Whenever you find yourself on the side of the majority, it is time to pause and reflect.

—MARK TWAIN

Anyone who lives within their means suffers from a lack of imagination.

—OSCAR WILDE, Irish dramatist and novelist

My hands were sweating again.

Staring down at the floor to avoid the blinding ceiling lights, I was supposedly one of the best in the world, but it just didn't register. My partner Alicia shifted from foot to foot as we stood in line with nine other couples, all chosen from over 1,000 competitors from 29 countries and four continents. It was the last day of the Tango World Championship semifinals, and this was our final run in front of the judges, television cameras, and cheering crowds. The other couples had an average of 15 years together. For us, it was the culmination of 5 months of nonstop 6-hour practices, and finally, it was showtime.

"How are you doing?" Alicia, a seasoned professional dancer, asked me in her distinctly Argentine Spanish.

"Fantastic. Awesome. Let's just enjoy the music. Forget the crowd—they're not even here."

That wasn't entirely true. It was hard to even fathom 50,000 spectators and coordinators in La Rural, even if it was the biggest exhibition hall in Buenos Aires. Through the thick haze of cigarette smoke, you could barely make out the huge undulating mass in the stands, and everywhere there was exposed floor, except the sacred 30′ **x** 40′ space in the middle of it all. I adjusted my pin-striped suit and fussed with my blue silk handkerchief until it was obvious that I was just fidgeting.

"Are you nervous?"

"I'm not nervous. I'm excited. I'm just going to have fun and let the rest follow."

"Number 152, you're up." Our chaperone had done his job, and now it was our turn. I whispered an inside joke to Alicia as we stepped on the hardwood platform: *"Tranquilo"*—Take it easy. She laughed, and at just that moment, I thought to myself, "What on earth would I be doing right now, if I hadn't left my job and the U.S. over a year ago?"

The thought vanished as quickly as it had appeared when the announcer came over the loudspeaker and the crowd erupted to match him: "Pareja numero 152, Timothy Ferriss y Alicia Monti, Ciudad de Buenos Aires!!!"

We were on, and I was beaming.

THE MOST FUNDAMENTAL of American questions is hard for me to answer these days, and luckily so. If it weren't, you wouldn't be holding this book in your hands.

"So, what do you do?"

Assuming you can find me (hard to do), and depending on when you ask me (I'd prefer you didn't), I could be racing motorcycles in Europe, scuba diving off a private island in Panama, resting under a palm tree between kickboxing sessions in Thailand, or dancing tango in Buenos Aires. The beauty is, I'm not a multimillionaire, nor do I particularly care to be.

I never enjoyed answering this cocktail question because it reflects an epidemic I was long part of: job descriptions as self-descriptions. If someone asks me now and is anything but absolutely sincere, I explain my lifestyle of mysterious means simply.

"I'm a drug dealer."

Pretty much a conversation ender. It's only half true, besides. The whole truth would take too long. How can I possibly explain that what I do with my time and what I do for money are completely different things? That I work less than four hours per week and make more per month than I used to make in a year?

For the first time, I'm going to tell you the real story. It involves a quiet subculture of people called the "New Rich."

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What does an igloo-dwelling millionaire do that a cubicle-dweller doesn't? Follow an uncommon set of rules.

How does a lifelong blue-chip employee escape to travel the world for a month without his boss even noticing? He uses technology to hide the fact.

Gold is getting old. The New Rich (**NR**) are those who abandon the deferred-life plan and create luxury lifestyles in the present using the currency of the New Rich: time and mobility. This is an art and a science we will refer to as Lifestyle Design (**LD**).

I've spent the last three years traveling among those who live in worlds currently beyond your imagination. Rather than hating reality, I'll show you how to bend it to your will. It's easier than it sounds. My journey from grossly overworked and severely underpaid office worker to member of the **NR** is at once stranger than fiction and—now that I've deciphered the code—simple to duplicate. There is a recipe.

Life doesn't have to be so damn hard. It really doesn't. Most people, my past self included, have spent too much time convincing themselves that life has to be hard, a resignation to 9-to-5 drudgery in exchange for (sometimes) relaxing weekends and the occasional keep-it-short-or-get-fired vacation.

The truth, at least the truth I live and will share in this book, is quite different. From leveraging currency differences to outsourcing your life and disappearing, I'll show you how a small underground uses economic sleight-of-hand to do what most consider impossible.

If you've picked up this book, chances are that you don't want to sit behind a desk until you are 62. Whether your dream is escaping the rat race, real-life fantasy travel, long-term wandering, setting world records, or simply a dramatic career change, this book will give you all the tools you need to make it a reality in the here-and-now instead of in the often elusive "retirement." There is a way to get the rewards for a life of hard work without waiting until the end.

How? It begins with a simple distinction most people miss—one I missed for 25 years.

People don't want to *be* millionaires—they want to experience what they believe only millions can buy. Ski chalets, butlers, and exotic travel often enter the picture. Perhaps rubbing cocoa butter on your belly in a hammock while you listen to waves rhythmically lapping against the deck of your thatched-roof bungalow? Sounds nice.

$1,000,000 in the bank isn't the fantasy. The fantasy is the lifestyle of complete freedom it supposedly allows. The question is then, *How can one achieve the millionaire lifestyle of complete freedom without first having $1,000,000?*

In the last five years, I have answered this question for myself, and this book will answer it for you. I will show you exactly how I have separated income from time and created my ideal lifestyle in the process, traveling the world and enjoying the best this planet has to offer. How on earth did I go from 14-hour days and $40,000 per year to 4-hour weeks and $40,000-plus per month?

It helps to know where it all started. Strangely enough, it was in a class of soon-to-be investment bankers.

In 2002, I was asked by Ed Zschau, übermentor and my former professor of High-tech Entrepreneurship at Princeton University, to come back and speak to the same class about my business adventures in the real world. I was stuck. There were already decamillionaires speaking to the same class, and even though I had built a highly profitable sports supplement company, I marched to a distinctly different drummer.

Over the ensuing days, however, I realized that everyone seemed to be discussing how to build large and successful companies, sell out, and live the good life. Fair enough. The question no one really seemed to be asking or answering was, Why do it all in the first place? What is the pot of gold that justifies spending the best years of your life hoping for happiness in the last?

The lectures I ultimately developed, titled "Drug Dealing for Fun and Profit," began with a simple

premise: Test the most basic assumptions of the work-life equation.

- ► How do your decisions change if retirement isn't an option?
- ► What if you could use a mini-retirement to sample your deferred-life plan reward before working 40 years for it?
- ► Is it really necessary to work like a slave to live like a millionaire?

Little did I know where questions like these would take me.

The uncommon conclusion? The commonsense rules of the "real world" are a fragile collection of socially reinforced illusions. This book will teach you how to see and seize the options others do not.

What makes this book different?

First, I'm not going to spend much time on the problem. I'm going to assume you are suffering from time famine, creeping dread, or—worst case—a tolerable and comfortable existence doing something unfulfilling. The last is most common and most insidious.

Second, this book is not about saving and will not recommend you abandon your daily glass of red wine for a million dollars 50 years from now. I'd rather have the wine. I won't ask you to choose between enjoyment today or money later. I believe you can have both now. The goal is fun *and* profit.

Third, this book is not about finding your "dream job." I will take as a given that, for most people, somewhere between six and seven billion of them, the perfect job is the one that takes the least time. The vast majority of people will never find a job that can be an unending source of fulfillment, so that is not the goal here; to free time and automate income is.

I OPEN EACH class with an explanation of the singular importance of being a "dealmaker." The manifesto of the dealmaker is simple: Reality is negotiable. Outside of science and law, all rules can be bent or broken, and it doesn't require being unethical.

The **DEAL** of deal making is also an acronym for the process of becoming a member of the New Rich.

The steps and strategies can be used with incredible results—whether you are an employee or an entrepreneur. Can you do everything I've done with a boss? No. Can you use the same principles to double your income, cut your hours in half, or at least double the usual vacation time? Most definitely.

Here is the step-by-step process you'll use to reinvent yourself:

D for Definition turns misguided common sense upside down and introduces the rules and objectives of the new game. It replaces self-defeating assumptions and explains concepts such as relative wealth and eustress.[1] Who are the **NR** and how do they operate? This section explains the overall lifestyle design recipe—the fundamentals—before we add the three ingredients.

E for Elimination kills the obsolete notion of time management once and for all. It shows exactly how I used the words of an often-forgotten Italian economist to turn 12-hour days into two-hour days … in 48 hours. Increase your per-hour results ten times or more with counterintuitive **NR** techniques for cultivating selective ignorance, developing a low-information diet, and otherwise ignoring the unimportant. This section provides the first of the three luxury lifestyle design ingredients: time.

A **for Automation** puts cash flow on autopilot using geographic arbitrage, outsourcing, and rules of nondecision. From bracketing to the routines of ultrasuccessful **NR**, it's all here. This section provides the second ingredient of luxury lifestyle design: income.

L **for Liberation** is the mobile manifesto for the globally inclined. The concept of mini-retirements is introduced, as are the means for flawless remote control and escaping the boss. Liberation is not about cheap travel; it is about forever breaking the bonds that confine you to a single location. This section delivers the third and final ingredient for luxury lifestyle design: mobility.

I should note that most bosses are less than pleased if you spend one hour in the office each day, and employees should therefore read the steps in the entrepreneurially minded **DEAL** order but implement them as **DELA**. If you decide to remain in your current job, it is necessary to create freedom of location before you cut your work hours by 80%. Even if you have never considered becoming an entrepreneur in the modern sense, the **DEAL** process will turn you into an entrepreneur in the purer sense as first coined by French economist J. B. Say in 1800—one who shifts economic resources out of an area of lower and into an area of higher yield.

Last but not least, much of what I recommend will seem impossible and even offensive to basic common sense—I expect that. Resolve now to test the concepts as an exercise in lateral thinking. If you try it, you'll see just how deep the rabbit hole goes, and you won't ever go back.

Take a deep breath and let me show you my world. And remember—*tranquilo*. It's time to have fun and let the rest follow.

TIM FERRISS

Tokyo, Japan
September 29, 2006

1. Uncommon terms are defined throughout this book as concepts are introduced. If something is unclear or you need a quick reference, please visit www.fourhourblog.com for an extensive glossary and other resources.

CHRONOLOGY OF A PATHOLOGY

An expert is a person who has made all the mistakes that can be made in a very narrow field.
—NIELS BOHR, Danish physicist and Nobel Prize winner

Ordinarily he was insane, but he had lucid moments when he was merely stupid.
—HEINRICH HEINE, German critic and poet

This book will teach you the precise principles I have used to become the following:

- ► Princeton University guest lecturer in high-tech entrepreneurship
- ► First American in history to hold a Guinness World Record in tango
- ► Advisor to more than 30 world-record holders in professional and Olympic sports
- ► *Wired* magazine's "Greatest Self-Promoter of 2008"
- ► National Chinese kickboxing champion
- ► Horseback archer *(yabusame)* in Nikko, Japan
- ► Political asylum researcher and activist
- ► MTV breakdancer in Taiwan
- ► Hurling competitor in Ireland
- ► Actor on hit TV series in mainland China and Hong Kong *(Human Cargo)*

How I got to this point is a tad less glamorous:

1977 Born 6 weeks premature and given a 10% chance of living. I survive instead and grow so fat that I can't roll onto my stomach. A muscular imbalance of the eyes makes me look in opposite directions, and my mother refers to me affectionately as "tuna fish." So far so good.

1983 Nearly fail kindergarten because I refuse to learn the alphabet. My teacher refuses to explain why I should learn it, opting instead for "I'm the teacher—that's why." I tell her that's stupid and ask her to leave me alone so I can focus on drawing sharks. She sends me to the "bad table" instead and makes me eat a bar of soap. Disdain for authority begins.

1991 My first job. Ah, the memories. I'm hired for minimum wage as the cleaner at an ice cream

parlor and quickly realize that the big boss's methods duplicate effort. I do it my way, finish in one hour instead of eight, and spend the rest of the time reading kung-fu magazines and practicing karate kicks outside. I am fired in a record three days, left with the parting comment, "Maybe someday you'll understand the value of hard work." It seems I still don't.

1993 I volunteer for a one-year exchange program in Japan, where people work themselves to death—a phenomenon called *karooshi*—and are said to want to be Shinto when born, Christian when married, and Buddhist when they die. I conclude that most people are really confused about life. One evening, intending to ask my host mother to wake me the next morning *(okosu)*, I ask her to violently rape me *(okasu)*. She is very confused.

1996 I manage to slip undetected into Princeton, despite SAT scores 40% lower than the average and my high school admissions counselor telling me to be more "realistic." I conclude I'm just not good at reality. I major in neuroscience and then switch to East Asian studies to avoid putting printer jacks on cat heads.

1997 Millionaire time! I create an audiobook called *How I Beat the Ivy League*, use all my money from three summer jobs to manufacture 500 tapes, and proceed to sell exactly none. I will allow my mother to throw them out only in 2006, just nine years of denial later. Such is the joy of baseless overconfidence.

1998 After four shot-putters kick a friend's head in, I quit bouncing, the highest-paying job on campus, and develop a speed-reading seminar. I plaster campus with hundreds of god-awful neon green flyers that read, "triple your reading speed in 3 hours!" and prototypical Princeton students proceed to write "bullsh*t" on every single one. I sell 32 spots at $50 each for the 3-hour event, and $533 per hour convinces me that finding a market before designing a product is smarter than the reverse. Two months later, I'm bored to tears of speed-reading and close up shop. I hate services and need a product to ship.

Fall 1998 A huge thesis dispute and the acute fear of becoming an investment banker drive me to commit academic suicide and inform the registrar that I am quitting school until further notice. My dad is convinced that I'll never go back, and I'm convinced that my life is over. My mom thinks it's no big deal and that there is no need to be a drama queen.

Spring 1999 In three months, I accept and quit jobs as a curriculum designer at Berlitz, the world's largest publisher of foreign-language materials, and as an analyst at a three-person political asylum research firm. Naturally, I then fly to Taiwan to create a gym chain out of thin air and get shut down by Triads, Chinese mafia. I return to the U.S. defeated and decide to learn kickboxing, winning the national championship four weeks later with the ugliest and most unorthodox style ever witnessed.

Fall 2000 Confidence restored and thesis completely undone, I return to Princeton. My life does not end, and it seems the yearlong delay has worked out in my favor. Twenty-somethings now have David Koresh–like abilities. My friend sells a company for $450 million, and I decide to head west to sunny California to make my billions. Despite the hottest job market in the history of the world, I manage to go jobless until three months after graduation, when I pull out my trump card and send one start-up CEO 32 consecutive e-mails. He finally gives in and puts me in sales.

Spring 2001 TrueSAN Networks has gone from a 15-person nobody to the "number one privately held data storage company" (how is that measured?) with 150 employees (what are they all doing?). I am ordered by a newly appointed sales director to "start with A" in the phone book and dial for dollars. I ask him in the most tactful way possible why we are doing it like retards. He says, "Because I say so." Not a good start.

Fall 2001 After a year of 12-hour days, I find out that I'm the second-lowest-paid person in the company aside from the receptionist. I resort to aggressively surfing the web full-time. One afternoon, having run out of obscene video clips to forward, I investigate how hard it would be to start a sports nutrition company. Turns out that you can outsource everything from manufacturing to ad design. Two weeks and $5,000 of credit card debt later, I have my first batch in production and a live website. Good

thing, too, as I'm fired exactly one week later.

2002–2003 BrainQUICKEN LLC has taken off, and I'm now making more than $40K per month instead of $40K per year. The only problem is that I hate life and now work 12-hour-plus days 7 days a week. Kinda painted myself into a corner. I take a one-week "vacation" to Florence, Italy, with my family and spend 10 hours a day in an Internet café freaking out. Sh*t balls. I begin teaching Princeton students how to build "successful" (i.e., profitable) companies.

Winter 2004 The impossible happens and I'm approached by an infomercial production company and an Israeli conglomerate (huh?) interested in buying my baby BrainQUICKEN. I simplify, eliminate, and otherwise clean house to make myself expendable. Miraculously, BQ doesn't fall apart, but both deals do. Back to Groundhog Day. Soon thereafter, both companies attempt to replicate my product and lose millions of dollars.

June 2004 I decide that, even if my company implodes, I need to escape before I go Howard Hughes. I turn everything upside down and—backpack in hand—go to JFK Airport in New York City, buying the first one-way ticket to Europe I can find. I land in London and intend to continue on to Spain for four weeks of recharging my batteries before returning to the salt mines. I start my relaxation by promptly having a nervous breakdown the first morning.

July 2004–2005 Four weeks turn into eight, and I decide to stay overseas indefinitely for a final exam in automation and experimental living, limiting e-mail to one hour each Monday morning. As soon as I remove myself as a bottleneck, profits increase 40%. What on earth do you do when you no longer have work as an excuse to be hyperactive and avoid the big questions? Be terrified and hold on to your ass with both hands, apparently.

September 2006 I return to the U.S. in an odd, Zen-like state after methodically destroying all of my assumptions about what can and cannot be done. "Drug Dealing for Fun and Profit" has evolved into a class on ideal lifestyle design. The new message is simple: I've seen the promised land, and there is good news. You can have it all.

Step I:
D is for Definition

Reality is merely an illusion,
albeit a very persistent one .

— ALBERT EINSTEIN

1
Cautions and Comparisons

These individuals have riches just as we say that we "have a fever," when really the fever has us.

— SENECA (4 B.C.–A.D. 65)

I also have in mind that seemingly wealthy, but most terribly impoverished class of all, who have accumulated dross, but know not how to use it, or get rid of it, and thus have forged their own golden or silver fetters.

— HENRY DAVID THOREAU (1817–1862)

1:00 A.M. CST / 30,000 FEET OVER LAS VEGAS

His friends, drunk to the point of speaking in tongues, were asleep. It was just the two of us now in first-class. He extended his hand to introduce himself, and an enormous—Looney Tunes enormous—diamond ring appeared from the ether as his fingers crossed under my reading light.

Mark was a legitimate magnate. He had, at different times, run practically all the gas stations, convenience stores, and gambling in South Carolina. He confessed with a half smile that, in an average trip to Sin City, he and his fellow weekend warriors might lose an average of $500,000 to $1,000,000—each. Nice.

He sat up in his seat as the conversation drifted to my travels, but I was more interested in his astounding record of printing money.

"So, of all your businesses, which did you like the most?"

The answer took less than a second of thought.

"None of them."

He explained that he had spent more than 30 years with people he didn't like to buy things he didn't need. Life had become a succession of trophy wives—he was on lucky number three—expensive cars, and other empty bragging rights. Mark was one of the living dead.

This is exactly where we don't want to end up.

Apples and Oranges: A Comparison

So, what makes the difference? What separates the New Rich, characterized by options, from the Deferrers (**D**), those who save it all for the end only to find that life has passed them by?

It begins at the beginning. The New Rich can be separated from the crowd based on their goals, which

reflect very distinct priorities and life philosophies.

Note how subtle differences in wording completely change the necessary actions for fulfilling what at a glance appear to be similar goals. These are not limited to business owners. Even the first, as I will show later, applies to employees.

D: To work for yourself.

NR: To have others work for you.

D: To work when you want to.

NR: To prevent work for work's sake, and to do the minimum necessary for maximum effect ("minimum effective load").

D: To retire early or young.

NR: To distribute recovery periods and adventures (mini-retirements) throughout life on a regular basis and recognize that inactivity is not the goal. Doing that which excites you is.

D: To buy all the things you want to have.

NR: To do all the things you want to do, and be all the things you want to be. If this includes some tools and gadgets, so be it, but they are either means to an end or bonuses, not the focus.

D: To be the boss instead of the employee; to be in charge.

NR: To be neither the boss nor the employee, but the owner. To own the trains and have someone else ensure they run on time.

D: To make a ton of money.

NR: To make a ton of money with specific reasons and defined dreams to chase, timelines and steps included. What are you working for?

D: To have more.

NR: To have more quality and less clutter. To have huge financial reserves but recognize that most material wants are justifications for spending time on the things that don't really matter, including buying things and preparing to buy things. You spent two weeks negotiating your new Infiniti with the dealership and got $10,000 off? That's great. Does your life have a purpose? Are you contributing anything useful to this world, or just shuffling papers, banging on a keyboard, and coming home to a drunken existence on the weekends?

D: To reach the big pay-off, whether IPO, acquisition, retirement, or other pot of gold.

NR: To think big but ensure payday comes every day: cash flow first, big payday second.

D: To have freedom from doing that which you dislike.

NR: To have freedom from doing that which you dislike, but also the freedom and resolve to pursue your dreams without reverting to work for work's sake (W4W). After years of repetitive work, you will often need to dig hard to find your passions, redefine your dreams, and revive hobbies that you let atrophy to near extinction. The goal is not to simply eliminate the bad, which does nothing more than leave you with a vacuum, but to pursue and experience the best in the world.

Getting Off the Wrong Train

The first principle is that you must not fool yourself, and you are the easiest person to fool.

—RICHARD P. FEYNMAN, Nobel Prize–winning physicist

Enough is enough. Lemmings no more. The blind quest for cash is a fool's errand.

I've chartered private planes over the Andes, enjoyed many of the best wines in the world in between world-class ski runs, and lived like a king, lounging by the infinity pool of a private villa. Here's the little secret I rarely tell: It all cost less than rent in the U.S. If you can free your time and location, your money is automatically worth 3–10 times as much.

This has nothing to do with currency rates. Being financially rich and having the ability to live like a millionaire are fundamentally two very different things.

Money is multiplied in practical value depending on the number of W's you control in your life: **what** you do, **when** you do it, **where** you do it, and with **whom** you do it. I call this the "freedom multiplier."

Using this as our criterion, the 80-hour-per-week, $500,000-per-year investment banker is less "powerful" than the employed **NR** who works ¼ the hours for $40,000, but has complete freedom of when, where, and how to live. The former's $500,000 may be worth less than $40,000 and the latter's $40,000 worth more than $500,000 when we run the numbers and look at the lifestyle output of their money.

Options—the ability to choose—is real power. This book is all about how to see and create those options with the least effort and cost. It just so happens, paradoxically, that you can make more money—a lot more money—by doing half of what you are doing now.

So, Who Are the NR?

- The employee who rearranges his schedule and negotiates a remote work agreement to achieve 90% of the results in one-tenth of the time, which frees him to practice cross-country skiing and take road trips with his family two weeks per month.

- The business owner who eliminates the least profitable customers and projects, outsources all operations entirely, and travels the world collecting rare documents, all while working remotely on a website to showcase her own illustration work.

- The student who elects to risk it all—which is nothing—to establish an online video rental service that delivers $5,000 per month in income from a small niche of Blu-ray aficionados, a two-hour-per-week side project that allows him to work full-time as an animal rights lobbyist.

The options are limitless, but each path begins with the same first step: replacing assumptions.

To join the movement, you will need to learn a new lexicon and recalibrate direction using a compass for an unusual world. From inverting responsibility to jettisoning the entire concept of "success," we need to change the rules.

New Players for a New Game: Global and Unrestricted

TURIN, ITALY

Civilization had too many rules for me, so I did my best to rewrite them.

—BILL COSBY

As he rotated 360 degrees through the air, the deafening noise turned to silence. Dale Begg-Smith executed the backflip perfectly—skis crossed in an X over his head—and landed in the record books as he slid across the finish.

It was February 16, 2006, and he was now a mogul-skiing gold medalist at the Turin Winter Olympics. Unlike other full-time athletes, he will never have to return to a dead-end job after his moment of glory, nor will he look back at this day as the climax of his only passion. After all, he was only 21 years old and drove a black Lamborghini.

Born a Canadian and something of a late bloomer, Dale found his calling, an Internet-based IT company, at the age of 13. Fortunately, he had a more-experienced mentor and partner to guide him: his 15-year-old brother, Jason. Created to fund their dreams of standing atop the Olympic podium, it would, only two years later, become the third-largest company of its kind in the world.

While Dale's teammates were hitting the slopes for extra sessions, he was often buying sake for clients in Tokyo. In a world of "work harder, not smarter," it came to pass that his coaches felt he was spending too much time on his business and not enough time in training, despite his results.

Rather than choose between his business or his dream, Dale chose to move laterally with both, from either/or to both/and. He wasn't spending too much time on his business; he and his brother were spending too much time with Canucks.

In 2002, they moved to the ski capital of the world, Australia, where the team was smaller, more flexible, and coached by a legend. Three short years later, he received citizenship, went head-to-head against former teammates, and became the third "Aussie" in history to win winter gold.

In the land of wallabies and big surf, Dale has since gone postal. Literally. Right next to the Elvis Presley commemorative edition, you can buy stamps with his face on them.

Fame has its perks, as does looking outside the choices presented to you. There are always lateral options.

NEW CALEDOINA, SOUTH PACIFIC OCEAN

Once you say you're going to settle for second, that's what happens to you in life.

—JOHN F. KENNEDY

Some people remain convinced that just a bit more money will make things right. Their goals are arbitrary moving targets: $300,000 in the bank, $1,000,000 in the portfolio, $100,000 a year instead of $50,000, etc. Julie's goal made intrinsic sense: come back with the same number of children she had left with.

She reclined in her seat and glanced across the aisle past her sleeping husband, Marc, counting as she had done thousands of times—one, two, three. So far so good. In 12 hours, they would all be back in Paris, safe and sound. That was assuming the plane from New Caledonia held together, of course.

New Caledonia?

Nestled in the tropics of the Coral Sea, New Caledonia was a French territory and where Julie and Marc had just sold the sailboat that took them 15,000 miles around the world. Of course, recouping their initial investment had been part of the plan. All said and done, their 15-month exploration of the globe, from the gondola-rich waterways of Venice to the tribal shores of Polynesia, had cost between $18,000 and $19,000. Less than rent and baguettes in Paris.

Most people would consider this impossible. Then again, most people don't know that more than 300 families set sail from France each year to do the same.

The trip had been a dream for almost two decades, relegated to the back of the line behind an ever-growing list of responsibilities. Each passing moment brought a new list of reasons for putting it off. One day, Julie realized that if she didn't do it now, she would never do it. The rationalizations, legitimate or not, would just continue to add up and make it harder to convince herself that escape was possible.

One year of preparation and one 30-day trial run with her husband later, they set sail on the trip of a lifetime. Julie realized almost as soon as the anchor lifted that, far from being a reason not to travel and seek adventure, children are perhaps the best reason of all to do both.

Pre-trip, her three little boys had fought like banshees at the drop of a hat. In the process of learning to coexist in a floating bedroom, they learned patience, as much for themselves as for the sanity of their parents. Pre-trip, books were about as appealing as eating sand. Given the alternative of staring at a wall on the open sea, all three learned to love books. Pulling them out of school for one academic year and exposing them to new environments had proven to be the best investment in their education to date.

Now sitting in the plane, Julie looked out at the clouds as the wing cut past them, already thinking of their next plans: to find a place in the mountains and ski all year long, using income from a sail-rigging workshop to fund the slopes and more travel.

Now that she had done it once, she had the itch.

► LIFESTYLE DESIGN IN ACTION

I was done with driving across town to collect my son from child- care only to slide across icy highways trying to get back to work with him in tow to finish my work. My mini-retirement brought us both to live at an alternative boarding school full of creative lifestyle redesigning children and staff in a gorgeous Florida forest with a spring-fed pond and plenty of sunshine. You can easily search for alternative schools or traditional schools that might accept your children during your stay. Alternative schools often see themselves as supportive communities and are exceptionally welcoming. You might even find an opportunity to work at a school where you could experience a new environment with your child.

—DEB

• • •

Tim,

Your book and blog have inspired me to quit my job, write two e-books, sky dive, backpack through South America, sell all the clutter in my life, and host an annual convention of the world's top dating instructors (my primary business venture, third year running). The best part? I can't even buy a drink yet.

Thank you so much, bro!

—ANTHONY

2
Rules That Change the Rules

► EVERYTHING POPULAR IS WRONG

I can't give you a surefire formula for success, but I can give you a formula for failure: try to please everybody all the time.

—HERBERT BAYARD SWOPE, American editor and journalist; first recipient of the Pulitzer Prize

Everything popular is wrong.

—OSCAR WILDE, *The Importance of Being Earnest*

Beating the Game, Not Playing the Game

In 1999, sometime after quitting my second unfulfilling job and eating peanut-butter sandwiches for comfort, I won the gold medal at the Chinese Kickboxing (Sanshou) National Championships.

It wasn't because I was good at punching and kicking. God forbid. That seemed a bit dangerous, considering I did it on a dare and had four weeks of preparation. Besides, I have a watermelon head—it's a big target.

I won by reading the rules and looking for unexploited opportunities, of which there were two:

1. Weigh-ins were the day prior to competition: Using dehydration techniques commonly practiced by elite powerlifters and Olympic wrestlers, I lost 28 pounds in 18 hours, weighed in at 165 pounds, and then hyperhydrated back to 193 pounds.[2] It's hard to fight someone from three weight classes above you. Poor little guys.

2. There was a technicality in the fine print: If one combatant fell off the elevated platform three times in a single round, his opponent won by default. I decided to use this technicality as my principal technique and push people off. As you might imagine, this did not make the judges the happiest Chinese I've ever seen.

The result? I won all of my matches by technical knock-out (TKO) and went home national champion, something 99% of those with 5–10 years of experience had been unable to do.

But, isn't pushing people out of the ring pushing the boundaries of ethics? Not at all—it's no more than doing the uncommon within the rules. The important distinction is that between official rules and self-imposed rules. Consider the following example, from the official website of the Olympic movement (www.olympic.org).

The 1968 Mexico City Olympics marked the international debut of Dick Fosbury and his celebrated "Fosbury flop," which would soon revolutionize high-jumping. At the time, jumpers… swung their outside foot up and over the bar [called the "straddle," much like a hurdle jump, it allowed you to land on your feet]. Fosbury's technique began by racing up to the bar at great speed and taking off from his right (or outside) foot. Then he twisted his body so that he went over the bar head-first with his back to the bar. While the coaches of the world shook their heads in disbelief, the Mexico City audience was absolutely captivated by Fosbury and shouted, "Olé!" as he cleared the bar. Fosbury cleared every height through 2.22 metres without a miss and then achieved a personal record of 2.24 metres to win the gold medal.

By 1980, 13 of the 16 Olympic finalists were using the Fosbury flop.

The weight-cutting techniques and off-platform throwing I used are now standard features of Sanshou competition. I didn't cause it, I just foresaw it as inevitable, as did others who tested this superior approach. Now it's par for the course.

Sports evolve when sacred cows are killed, when basic assumptions are tested.

The same is true in life and in lifestyles.

Challenging the Status Quo vs. Being Stupid

Most people walk down the street on their legs. Does that mean I walk down the street on my hands? Do I wear my underwear outside of my pants in the name of being different? Not usually, no. Then again, walking on my legs and keeping my thong on the inside have worked just fine thus far. I don't fix it if it isn't broken.

Different is better when it is more effective or more fun.

If everyone is defining a problem or solving it one way and the results are subpar, this is the time to ask, What if I did the opposite? Don't follow a model that doesn't work. If the recipe sucks, it doesn't matter how good a cook you are.

When I was in data storage sales, my first gig out of college, I realized that most cold calls didn't get to the intended person for one reason: gatekeepers. If I simply made all my calls from 8:00–8:30 A.M. and 6:00–6:30 P.M., for a total of one hour, I was able to avoid secretaries and book more than twice as many meetings as the senior sales executives who called from 9–5. In other words, I got twice the results for 1/8 the time.

From Japan to Monaco, from globetrotting single mothers to multimillionaire racecar drivers, the basic rules of successful **NR** are surprisingly uniform and predictably divergent from what the rest of the world is doing.

The following rules are the fundamental differentiators to keep in mind throughout this book.

1. Retirement Is Worst-Case-Scenario Insurance.

Retirement planning is like life insurance. It should be viewed as nothing more than a hedge against the absolute worst-case scenario: in this case, becoming physically incapable of working and needing a reservoir of capital to survive.

Retirement as a goal or final redemption is flawed for at least three solid reasons:

1. It is predicated on the assumption that you dislike what you are doing during the most physically capable years of your life. This is a nonstarter—nothing can justify that sacrifice.
2. Most people will never be able to retire and maintain even a hotdogs-for-dinner standard of living. Even one million is chump change in a world where traditional retirement could span 30 years and inflation lowers your purchasing power 2–4% per year. The math doesn't work.[3] The golden years become lower-middle-class life revisited. That's a bittersweet ending.
3. If the math does work, it means that you are one ambitious, hardworking machine. If that's the case, guess what? One week into retirement, you'll be so damn bored that you'll want to stick bicycle spokes in your eyes. You'll probably opt to look for a new job or start another company. Kinda defeats the purpose of waiting, doesn't it?

I'm not saying don't plan for the worst case—I have maxed out 401(k)s and IRAs I use primarily for tax purposes—but don't mistake retirement for the goal.

2. Interest and Energy Are Cyclical.

If I offered you $10,000,000 to work 24 hours a day for 15 years and then retire, would you do it? Of course not—you couldn't. It is unsustainable, just as what most define as a career: doing the same thing for 8+ hours per day until you break down or have enough cash to permanently stop.

How else can my 30-year-old friends all look like a cross between Donald Trump and Joan Rivers? It's horrendous—premature aging fueled by triple bypass frappuccinos and impossible workloads.

Alternating periods of activity and rest is necessary to survive, let alone thrive. Capacity, interest, and mental endurance all wax and wane. Plan accordingly.

The **NR** aims to distribute "mini-retirements" throughout life instead of hoarding the recovery and enjoyment for the fool's gold of retirement. By working only when you are most effective, life is both more productive and more enjoyable. It's the perfect example of having your cake and eating it, too.

Personally, I now aim for one month of overseas relocation or high-intensity learning (tango, fighting, whatever) for every two months of work projects.

3. Less Is Not Laziness.

Doing less meaningless work, so that you can focus on things of greater personal importance, is NOT laziness. This is hard for most to accept, because our culture tends to reward personal sacrifice instead of personal productivity.

Few people choose to (or are able to) measure the results of their actions and thus measure their contribution in time. More time equals more self-worth and more reinforcement from those above and around them. The **NR**, despite fewer hours in the office, produce more meaningful results than the next dozen non-**NR** combined.

Let's define "laziness" anew—to endure a non-ideal existence, to let circumstance or others decide life for you, or to amass a fortune while passing through life like a spectator from an office window. The size of your bank account doesn't change this, nor does the number of hours you log in handling unimportant e-mail or minutiae.

Focus on being productive instead of busy.

4. The Timing Is Never Right.

I once asked my mom how she decided when to have her first child, little ol' me. The answer was simple: "It was something we wanted, and we decided there was no point in putting it off. The timing is never right to have a baby." And so it is.

For all of the most important things, the timing always sucks. Waiting for a good time to quit your job? The stars will never align and the traffic lights of life will never all be green at the same time. The universe doesn't conspire against you, but it doesn't go out of its way to line up all the pins either. Conditions are never perfect. "Someday" is a disease that will take your dreams to the grave with you. Pro and con lists are just as bad. If it's important to you and you want to do it "eventually," just do it and correct course along the way.

5. Ask for Forgiveness, Not Permission.

If it isn't going to devastate those around you, try it and then justify it. People—whether parents, partners, or bosses—deny things on an emotional basis that they can learn to accept after the fact. If the potential damage is moderate or in any way reversible, don't give people the chance to say no. Most people are fast to stop you before you get started but hesitant to get in the way if you're moving. Get good at being a troublemaker and saying sorry when you really screw up.

6. Emphasize Strengths, Don't Fix Weaknesses.

Most people are good at a handful of things and utterly miserable at most. I am great at product creation and marketing but terrible at most of the things that follow.

My body is designed to lift heavy objects and throw them, and that's it. I ignored this for a long time. I tried swimming and looked like a drowning monkey. I tried basketball and looked like a caveman. Then I became a fighter and took off.

It is far more lucrative and fun to leverage your strengths instead of attempting to fix all the chinks in your armor. The choice is between *multiplication* of results using strengths or *incremental* improvement fixing weaknesses that will, at best, become mediocre. Focus on better use of your best weapons instead of constant repair.

7. Things in Excess Become Their Opposite.

It is possible to have too much of a good thing. In excess, most endeavors and possessions take on the characteristics of their opposite. Thus:

> Pacifists become militants.
> Freedom fighters become tyrants.
> Blessings become curses.
> Help becomes hindrance. More becomes less.[4]

Too much, too many, and too often of what you want becomes what you don't want. This is true of possessions and even time. Lifestyle Design is thus not interested in creating an excess of idle time, which is poisonous, but the positive use of free time, defined simply as doing what you want as opposed to what you feel obligated to do.

8. Money Alone Is Not the Solution.

There is much to be said for the power of money as currency (I'm a fan myself), but adding more of it just isn't the answer as often as we'd like to think. In part, it's laziness. "If only I had more money" is the easiest way to postpone the intense self-examination and decision-making necessary to create a life of enjoyment—now and not later. By using money as the scapegoat and work as our all-consuming routine, we are able to conveniently disallow ourselves the time to do otherwise: "John, I'd love to talk about the gaping void I feel in my life, the hopelessness that hits me like a punch in the eye every time I start my computer in the morning, but I have so much work to do! I've got at least three hours of unimportant e-mail to reply to before calling the prospects who said 'no' yesterday. Gotta run!"

Busy yourself with the routine of the money wheel, pretend it's the fix-all, and you artfully create a constant distraction that prevents you from seeing just how pointless it is. Deep down, you know it's all an illusion, but with everyone participating in the same game of make-believe, it's easy to forget.

The problem is more than money.

9. Relative Income Is More Important Than Absolute Income.

Among dietitians and nutritionists, there is some debate over the value of a calorie. Is a calorie a calorie, much like a rose is a rose? Is fat loss as simple as expending more calories than you consume, or is the source of those calories important? Based on work with top athletes, I know the answer to be the latter.

What about income? Is a dollar is a dollar is a dollar? The New Rich don't think so.

Let's look at this like a fifth-grade math problem. Two hardworking chaps are headed toward each

other. Chap A moving at 80 hours per week and Chap B moving at 10 hours per week. They both make $50,000 per year. Who will be richer when they pass in the middle of the night? If you said B, you would be correct, and this is the difference between **absolute** and **relative** income.

Absolute income is measured using one holy and inalterable variable: the raw and almighty dollar. Jane Doe makes $100,000 per year and is thus twice as rich as John Doe, who makes $50,000 per year.

Relative income uses two variables: the dollar and time, usually hours. The whole "per year" concept is arbitrary and makes it easy to trick yourself. Let's look at the real trade. Jane Doe makes $100,000 per year, $2,000 for each of 50 weeks per year, and works 80 hours per week. Jane Doe thus makes $25 per hour. John Doe makes $50,000 per year, $1,000 for each of 50 weeks per year, but works 10 hours per week and hence makes $100 per hour. In relative income, John is *four times* richer.

Of course, relative income has to add up to the minimum amount necessary to actualize your goals. If I make $100 per hour but only work one hour per week, it's going to be hard for me to run amuck like a superstar. Assuming that the total absolute income is where it needs to be to live my dreams (not an arbitrary point of comparison with the Joneses), relative income is the real measurement of wealth for the New Rich.

The top New Rich mavericks make at least $5,000 per hour. Out of college, I started at about $5. I'll get you closer to the former.

10. Distress Is Bad, Eustress Is Good.

Unbeknownst to most fun-loving bipeds, not all stress is bad. Indeed, the New Rich don't aim to eliminate all stress. Not in the least. There are two separate types of stress, each as different as euphoria and its seldom-mentioned opposite, *dys*phoria.

*Dis*tress refers to harmful stimuli that make you weaker, less confident, and less able. Destructive criticism, abusive bosses, and smashing your face on a curb are examples of this. These are things we want to avoid.

*Eu*stress, on the other hand, is a word most of you have probably never heard. *Eu-*, a Greek prefix for "healthy," is used in the same sense in the word "euphoria." Role models who push us to exceed our limits, physical training that removes our spare tires, and risks that expand our sphere of comfortable action are all examples of eustress—stress that is healthful and the stimulus for growth.

People who avoid all criticism fail. It's destructive criticism we need to avoid, not criticism in all forms. Similarly, there is no progress without eustress, and the more eustress we can create or apply to our lives, the sooner we can actualize our dreams. The trick is telling the two apart.

The New Rich are equally aggressive in removing distress and finding eustress.

► Q&A: QUESTIONS AND ACTIONS

1. How has being "realistic" or "responsible" kept you from the life you want?
2. How has doing what you "should" resulted in subpar experiences or regret for not having done something else?
3. Look at what you're currently doing and ask yourself, "What would happen if I did the opposite of the people around me? What will I sacrifice if I continue on this track for 5, 10, or 20 years?"

2. Most people will assume this type of weight manipulation is impossible, so I've provided sample photographs at www.fourhourblog.com. Do NOT try this at home. I did it all under medical

supervision.

3. "Living Well" *(Barron's*, March 20, 2006, Suzanne McGee).

4. Goldian VandenBroeck, ed. From *Less Is More: An Anthology of Ancient and Modern Voices Raised in Praise of Simplicity* (Inner Traditions, 1996).

3
Dodging Bullets

► FEAR-SETTING AND ESCAPING PARALYSIS

Many a false step was made by standing still.
—FORTUNE COOKIE

Named must your fear be before banish it you can.
—YODA, from *Star Wars: The Empire Strikes Back*

RIO DE JANEIRO, BRAZIL

Twenty feet and closing.

"Run! Ruuuuuuuuuun!" Hans didn't speak Portuguese, but the meaning was clear enough—haul ass. His sneakers gripped firmly on the jagged rock, and he drove his chest forward toward 3,000 feet of nothing.

He held his breath on the final step, and the panic drove him to near unconsciousness. His vision blurred at the edges, closing to a single pinpoint of light, and then … he floated. The all-consuming celestial blue of the horizon hit his visual field an instant after he realized that the thermal updraft had caught him and the wings of the paraglider. Fear was behind him on the mountaintop, and thousands of feet above the resplendent green rain forest and pristine white beaches of Copacabana, Hans Keeling had seen the light.

That was Sunday.

On Monday, Hans returned to his law office in Century City, Los Angeles's posh corporate haven, and promptly handed in his three-week notice. For nearly five years, he had faced his alarm clock with the same dread: I have to do *this* for another 40–45 years? He had once slept under his desk at the office after a punishing half-done project, only to wake up and continue on it the next morning. That same morning, he had made himself a promise: two more times and I'm out of here. Strike number three came the day before he left for his Brazilian vacation.

We all make these promises to ourselves, and Hans had done it before as well, but things were now

somehow different. He was different. He had realized something while arcing in slow circles toward the earth—risks weren't that scary once you took them. His colleagues told him what he expected to hear: He was throwing it all away. He was an attorney on his way to the top—what the hell did he want?

Hans didn't know exactly what he wanted, but he had tasted it. On the other hand, he did know what bored him to tears, and he was done with it. No more passing days as the living dead, no more dinners where his colleagues compared cars, riding on the sugar high of a new BMW purchase until someone bought a more expensive Mercedes. It was over.

Immediately, a strange shift began—Hans felt, for the first time in a long time, at peace with himself and what he was doing. He had always been terrified of plane turbulence, as if he might die with the best inside of him, but now he could fly through a violent storm sleeping like a baby. Strange indeed.

More than a year later, he was still getting unsolicited job offers from law firms, but by then had started Nexus Surf,[5] a premier surf-adventure company based in the tropical paradise of Florianopolis, Brazil. He had met his dream girl, a Carioca with caramel-colored skin named Tatiana, and spent most of his time relaxing under palm trees or treating clients to the best times of their lives.

Is this what he had been so afraid of?

These days, he often sees his former self in the underjoyed and overworked professionals he takes out on the waves. Waiting for the swell, the true emotions come out: "God, I wish I could do what you do." His reply is always the same: "You can."

The setting sun reflects off the surface of the water, providing a Zen-like setting for a message he knows is true: It's not giving up to put your current path on indefinite pause. He could pick up his law career exactly where he left off if he wanted to, but that is the furthest thing from his mind.

As they paddle back to shore after an awesome session, his clients get ahold of themselves and regain their composure. They set foot on shore, and reality sinks its fangs in: "I would, but I can't really throw it all away."

He has to laugh.

The Power of Pessimism: Defining the Nightmare

Action may not always bring happiness, but there is no happiness without action.

—BENJAMIN DISRAELI, former British Prime Minister

To door not to do? To try or not to try? Most people will vote no, whether they consider themselves brave or not. Uncertainty and the prospect of failure can be very scary noises in the shadows. Most people will choose unhappiness over uncertainty. For years, I set goals, made resolutions to change direction, and nothing came of either. I was just as insecure and scared as the rest of the world.

The simple solution came to me accidentally four years ago. At that time, I had more money than I knew what to do with—I was making $70K or so per month—and I was completely miserable, worse than ever. I had no time and was working myself to death. I had started my own company, only to realize it would be nearly impossible to sell.[6] Oops. I felt trapped and stupid at the same time. I should be able to figure this out, I thought. Why am I such an idiot? Why can't I make this work?! Buckle up and stop being such a (insert expletive)! What's wrong with me? The truth was, nothing was wrong with me. I hadn't reached my limit; I'd reached the limit of my business model at the time. It wasn't the driver, it was the vehicle.

Critical mistakes in its infancy would never let me sell it. I could hire magic elves and connect my brain to a supercomputer—it didn't matter. My little baby had some serious birth defects. The question then became, How do I free myself from this Frankenstein while making it self-sustaining? How do I pry myself from the tentacles of workaholism and the fear that it would fall to pieces without my 15-hour days? How do I escape this self-made prison? A trip, I decided. A sabbatical year around the world.

So I took the trip, right? Well, I'll get to that. First, I felt it prudent to dance around with my shame, embarrassment, and anger for six months, all the while playing an endless loop of reasons why my cop-out fantasy trip could never work. One of my more productive periods, for sure.

Then, one day, in my bliss of envisioning how bad my future suffering would be, I hit upon a gem of an idea. It was surely a highlight of my "don't happy, be worry" phase: Why don't I decide exactly what my nightmare would be—the worst thing that could possibly happen as a result of my trip?

Well, my business could fail while I'm overseas, for sure. Probably would. A legal warning letter would accidentally not get forwarded and I would get sued. My business would be shut down, and inventory would spoil on the shelves while I'm picking my toes in solitary misery on some cold shore in Ireland. Crying in the rain, I imagine. My bank account would crater by 80% and certainly my car and motorcycle in storage would be stolen. I suppose someone would probably spit on my head from a high-rise balcony while I'm feeding food scraps to a stray dog, which would then spook and bite me squarely on the face. God, life is a cruel, hard bitch.

Conquering Fear = Defining Fear

> Set aside a certain number of days, during which you shall be content with the scantiest and cheapest fare, with course and rough dress, saying to yourself the while: "Is this the condition that I feared?"
>
> —SENECA

Then a funny thing happened. In my undying quest to make myself miserable, I accidentally began to backpedal. As soon as I cut through the vague unease and ambiguous anxiety by defining my nightmare, the worst-case scenario, I wasn't as worried about taking a trip. Suddenly, I started thinking of simple steps I could take to salvage my remaining resources and get back on track if all hell struck at once. I could always take a temporary bartending job to pay the rent if I had to. I could sell some furniture and cut back on eating out. I could steal lunch money from the kindergarteners who passed by my apartment every morning. The options were many. I realized it wouldn't be that hard to get back to where I was, let alone survive. None of these things would be fatal—not even close. Mere panty pinches on the journey of life.

I realized that on a scale of 1–10, 1 being nothing and 10 being permanently life-changing, my so-called worst-case scenario might have a *temporary* impact of 3 or 4. I believe this is true of most people and most would-be "holy sh*t, my life is over" disasters. Keep in mind that this is the one-in-a-million disaster nightmare. On the other hand, if I realized my best-case scenario, or even a probable-case scenario, it would easily have a *permanent* 9 or 10 positive life-changing effect.

In other words, I was risking an unlikely and temporary 3 or 4 for a probable and permanent 9 or 10, and I could easily recover my baseline workaholic prison with a bit of extra work if I wanted to. This all equated to a significant realization: There was practically no risk, only huge life-changing upside potential, and I could resume my previous course without any more effort than I was already putting forth.

That is when I made the decision to take the trip and bought a one-way ticket to Europe. I started planning my adventures and eliminating my physical and psychological baggage. None of my disasters came to pass, and my life has been a near fairy tale since. The business did better than ever, and I practically forgot about it as it financed my travels around the world in style for 15 months.

Uncovering Fear Disguised as Optimism

> There's no difference between a pessimist who says, "Oh, it's hopeless, so don't bother doing anything," and an optimist who says, "Don't bother doing anything, it's going to turn out fine anyway." Either way, nothing happens.
>
> —YVON CHOUINARD,[7] founder of Patagonia

Fear comes in many forms, and we usually don't call it by its four-letter name. Fear itself is quite fear-inducing. Most intelligent people in the world dress it up as something else: optimistic denial. Most who avoid quitting their jobs entertain the thought that their course will improve with time or increases in income. This seems valid and is a tempting hallucination when a job is boring or uninspiring instead of pure hell. Pure hell forces action, but anything less can be endured with enough clever rationalization.

Do you really think it will improve or is it wishful thinking and an excuse for inaction? If you were confident in improvement, would you really be questioning things so? Generally not. This is fear of the unknown disguised as optimism.

Are you better off than you were one year ago, one month ago, or one week ago?

If not, things will not improve by themselves. If you are kidding yourself, it is time to stop and plan for a jump. Barring any James Dean ending, your life is going to be LONG. Nine to five for your working lifetime of 40–50 years is a long-ass time if the rescue doesn't come. About 500 months of solid work.

How many do you have to go? It's probably time to cut your losses.

Someone Call the Maître D'

> You have comfort. You don't have luxury. And don't tell me that money plays a part. The luxury I advocate has nothing to do with money. It cannot be bought. It is the reward of those who have no fear of discomfort.
>
> —JEAN COCTEAU, French poet, novelist, boxing manager, and filmmaker, whose collaborations were the inspiration for the term "surrealism"

Sometimes timing is perfect. There are hundreds of cars circling a parking lot, and someone pulls out of a spot 10 feet from the entrance just as you reach his or her bumper. Another Christmas miracle!

Other times, the timing could be better. The phone rings during sex and seems to ring for a half hour. The UPS guy shows up 10 minutes later. Bad timing can spoil the fun.

Jean-Marc Hachey landed in West Africa as a volunteer, with high hopes of lending a helping hand. In that sense, his timing was great. He arrived in Ghana in the early 1980s, in the middle of a coup d'état, at

the peak of hyperinflation, and just in time for the worst drought in a decade. For these same reasons, some people would consider his timing quite poor from a more selfish survival standpoint.

He had also missed the memo. The national menu had changed, and they were out of luxuries like bread and clean water. He would be surviving for four months on a slushlike concoction of corn meal and spinach. Not what most of us would order at the movie theater.

"WOW, I CAN SURVIVE."

Jean-Marc had passed the point of no return, but it didn't matter. After two weeks of adjusting to the breakfast, lunch, and dinner (Mush à la Ghana), he had no desire to escape. The most basic of foods and good friends proved to be the only real necessities, and what would seem like a disaster from the outside was the most life-affirming epiphany he'd ever experienced: The worst really wasn't that bad. To enjoy life, you don't need fancy nonsense, but you do need to control your time and realize that most things just aren't as serious as you make them out to be.

Now 48, Jean-Marc lives in a nice home in Ontario, but could live without it. He has cash, but could fall into poverty tomorrow and it wouldn't matter. Some of his fondest memories still include nothing but friends and gruel. He is dedicated to creating special moments for himself and his family and is utterly unconcerned with retirement. He's already lived 20 years of partial retirement in perfect health.

Don't save it all for the end. There is every reason not to.

► Q&A: QUESTIONS AND ACTIONS

I am an old man and have known a great many troubles, but most of them never happened.

—MARK TWAIN

If you are nervous about making the jump or simply putting it off out of fear of the unknown, here is your antidote. Write down your answers, and keep in mind that thinking a lot will not prove as fruitful or as prolific as simply brain vomiting on the page. Write and do not edit—aim for volume. Spend a few minutes on each answer.

1. **Define your nightmare, the absolute worst that could happen if you did what you are considering**. What doubt, fears, and "what-ifs" pop up as you consider the big changes you can—or need—to make? Envision them in painstaking detail. Would it be the end of your life? What would be the permanent impact, if any, on a scale of 1–10? Are these things really permanent? How likely do you think it is that they would actually happen?
2. **What steps could you take to repair the damage or get things back on the upswing, even if temporarily?** Chances are, it's easier than you imagine. How could you get things back under control?
3. **What are the outcomes or benefits, both temporary and permanent, of more probable scenarios?** Now that you've defined the nightmare, what are the more probable or definite positive outcomes, whether internal (confidence, self-esteem, etc.) or external? What would the impact of these more-likely outcomes be on a scale of 1–10? How likely is it that you could produce at least a moderately good outcome? Have less intelligent people done this before and pulled it off?

4. **If you were fired from your job today, what would you do to get things under financial control?** Imagine this scenario and run through questions 1–3 above. If you quit your job to test other options, how could you later get back on the same career track if you absolutely had to?
5. **What are you putting off out of fear?** Usually, what we most fear doing is what we most need to do. That phone call, that conversation, whatever the action might be—it is fear of unknown outcomes that prevents us from doing what we need to do. Define the worst case, accept it, and do it. I'll repeat something you might consider tattooing on your forehead: *What we fear doing most is usually what we most need to do*. As I have heard said, a person's success in life can usually be measured by the number of uncomfortable conversations he or she is willing to have. Resolve to do one thing every day that you fear. I got into this habit by attempting to contact celebrities and famous businesspeople for advice.
6. **What is it costing you—financially, emotionally, and physically—to postpone action?** Don't only evaluate the potential downside of action. It is equally important to measure the atrocious cost of inaction. If you don't pursue those things that excite you, where will you be in one year, five years, and ten years? How will you feel having allowed circumstance to impose itself upon you and having allowed ten more years of your finite life to pass doing what you know will not fulfill you? If you telescope out 10 years and know with 100% certainty that it is a path of disappointment and regret, and if we define risk as "the likelihood of an irreversible negative outcome," inaction is the greatest risk of all.
7. **What are you waiting for?** If you cannot answer this without resorting to the previously rejected concept of good timing, the answer is simple: You're afraid, just like the rest of the world. Measure the cost of inaction, realize the unlikelihood and re-pairability of most missteps, and develop the most important habit of those who excel and enjoy doing so: action.

5. www.nexussurf.com

6. This turned out to be yet another self-imposed limitation and false construct. BrainQUICKEN was acquired by a private equity firm in 2009. The process is described on www.fourhourblog.com.

7. http://www.tpl.org/tier3_cd.cfm?content_item_id=5307&folder_id=1545.

4
System Reset

► BEING UNREASONABLE AND UNAMBIGUOUS

"Would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the Cat.

"I don't much care where …" said Alice.

"Then it doesn't matter which way you go," said the Cat.

—LEWIS CARROLL, *Alice in Wonderland*

The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.

—GEORGE BERNARD SHAW, *Maxims for Revolutionists*

SPRING 2005 / PRINCETON , NEW JERSEY

I had to bribe them. What other choice did I have?

They formed a circle around me, and, while the names differed, the question was one and the same: "What's the challenge?" All eyes were on me.

My lecture at Princeton University had just ended with excitement and enthusiasm. At the same time, I knew that most students would go out and promptly do the opposite of what I preached. Most of them would be putting in 80-hour weeks as high-paid coffee fetchers unless I showed that the principles from class could actually be applied.

Hence the challenge.

I was offering a round-trip ticket anywhere in the world to anyone who could complete an undefined "challenge" in the most impressive fashion possible. Results plus style. I told them to meet me after class if interested, and here they were, nearly 20 out of 60 students.

The task was designed to test their comfort zones while forcing them to use some of the tactics I teach. It was simplicity itself: Contact three seemingly impossible-to-reach people—J.Lo, Bill Clinton, J. D. Salinger, I don't care—and get at least one to reply to three questions.

Of 20 students, all frothing at the mouth to win a free spin across the globe, how many completed the challenge?

Exactly … none. Not a one.

There were many excuses: "It's not that easy to get someone to …" "I have a big paper due, and …" "I would love to, but there's no way I can…." There was but one real reason, however, repeated over and over again in different words: It was a difficult challenge, perhaps impossible, and the other students would outdo them. Since all of them overestimated the competition, no one even showed up.

According to the rules I had set, if someone had sent me no more than an illegible one-paragraph response, I would have been obligated to give them the prize. This result both fascinated and depressed me.

The following year, the outcome was quite different.

I told the above cautionary tale and 6 out of 17 finished the challenge in less than 48 hours. Was the second class better? No. In fact, there were more capable students in the first class, but they did nothing. Firepower up the wazoo and no trigger finger.

The second group just embraced what I told them before they started, which was …

Doing the Unrealistic Is Easier Than Doing the Realistic

From contacting billionaires to rubbing elbows with celebrities—the second group of students did both—it's as easy as believing it can be done.

It's lonely at the top. Ninety-nine percent of people in the world are convinced they are incapable of achieving great things, so they aim for the mediocre. The level of competition is thus fiercest for "realistic" goals, paradoxically making them the most time-and energy-consuming. It is easier to raise $1,000,000 than it is $100,000. It is easier to pick up the one perfect 10 in the bar than the five 8s.

If you are insecure, guess what? The rest of the world is, too. Do not overestimate the competition and underestimate yourself. You are better than you think.

Unreasonable and unrealistic goals are easier to achieve for yet another reason.

Having an unusually large goal is an adrenaline infusion that provides the endurance to overcome the inevitable trials and tribulations that go along with any goal. Realistic goals, goals restricted to the average ambition level, are uninspiring and will only fuel you through the first or second problem, at which point you throw in the towel. If the potential payoff is mediocre or average, so is your effort. I'll run through walls to get a catamaran trip through the Greek islands, but I might not change my brand of cereal for a weekend trip through Columbus, Ohio. If I choose the latter because it is "realistic," I won't have the enthusiasm to jump even the smallest hurdle to accomplish it. With beautiful, crystal-clear Greek waters and delicious wine on the brain, I'm prepared to do battle for a dream that is worth dreaming. Even though their difficulty of achievement on a scale of 1–10 appears to be a 10 and a 2 respectively, Columbus is more likely to fall through.

The fishing is best where the fewest go, and the collective insecurity of the world makes it easy for people to hit home runs while everyone else is aiming for base hits. There is just less competition for bigger goals.

Doing big things begins with asking for them properly.

What Do You Want? A Better Question, First of All

Most people will never know what they want. I don't know what I want. If you ask me what I want to do in the next five months for language learning, on the other hand, I do know. It's a matter of specificity. "What do you want?" is too imprecise to produce a meaningful and actionable answer. Forget about it.

"What are your goals?" is similarly fated for confusion and guesswork. To rephrase the question, we need to take a step back and look at the bigger picture.

Let's assume we have 10 goals and we achieve them—what is the desired outcome that makes all the effort worthwhile? The most common response is what I also would have suggested five years ago: happiness. I no longer believe this is a good answer. Happiness can be bought with a bottle of wine and has become ambiguous through overuse. There is a more precise alternative that reflects what I believe the actual objective is.

Bear with me. What is the opposite of happiness? Sadness? No. Just as love and hate are two sides of the same coin, so are happiness and sadness. Crying out of happiness is a perfect illustration of this. The opposite of love is indifference, and the opposite of happiness is—here's the clincher—boredom.

Excitement is the more practical synonym for happiness, and it is precisely what you should strive to chase. It is the cure-all. When people suggest you follow your "passion" or your "bliss," I propose that

they are, in fact, referring to the same singular concept: excitement.

This brings us full circle. The question you should be asking isn't, "What do I want?" or "What are my goals?" but "What would excite me?"

Adult-Onset ADD: Adventure Deficit Disorder

Somewhere between college graduation and your second job, a chorus enters your internal dialogue: Be realistic and stop pretending. Life isn't like the movies.

If you're five years old and say you want to be an astronaut, your parents tell you that you can be anything you want to be. It's harmless, like telling a child that Santa Claus exists. If you're 25 and announce you want to start a new circus, the response is different: Be realistic; become a lawyer or an accountant or a doctor, have babies, and raise them to repeat the cycle.

If you do manage to ignore the doubters and start your own business, for example, ADD doesn't disappear. It just takes a different form.

When I started BrainQUICKEN LLC in 2001, it was with a clear goal in mind: Make $1,000 per day whether I was banging my head on a laptop or cutting my toenails on the beach. It was to be an automated source of cash flow. If you look at my chronology, it is obvious that this didn't happen until a meltdown forced it, despite the requisite income. Why? The goal wasn't specific enough. I hadn't defined *alternate activities* that would replace the initial workload. Therefore, I just continued working, even though there was no financial need. I needed to feel productive and had no other vehicles.

This is how most people work until death: "I'll just work until I have X dollars and then do what I want." If you don't define the "what I want" alternate activities, the X figure will increase indefinitely to avoid the fear-inducing uncertainty of this void.

This is when both employees and entrepreneurs become fat men in red BMWs.

The Fat Man in the Red BMW Convertible

There have been several points in my life—among them, just before I was fired from TrueSAN and just before I escaped the U.S. to avoid taking an Uzi into McDonald's—at which I saw my future as another fat man in a midlife-crisis BMW. I simply looked at those who were 15–20 years ahead of me on the same track, whether a director of sales or an entrepreneur in the same industry, and it scared the hell out of me.

It was such an acute phobia, and such a perfect metaphor for the sum of all fears, that it became a pattern interrupt between myself and fellow lifestyle designer and entrepreneur Douglas Price. Doug and I traveled parallel paths for nearly five years, facing the same challenges and self-doubt and thus keeping a close psychological eye on each other. Our down periods seem to alternate, making us a good team.

Whenever one of us began to set our sights lower, lose faith, or "accept reality," the other would chime in via phone or e-mail like an A A sponsor: "Dude, are you turning into the bald fat man in the red BMW convertible?" The prospect was terrifying enough that we always got our asses and priorities back on track immediately. The worst that could happen wasn't crashing and burning, it was accepting

terminal boredom as a tolerable status quo.

Remember—boredom is the enemy, not some abstract "failure."

Correcting Course: Get Unrealistic

There is a process that I have used, and still use, to reignite life or correct course when the Fat Man in the BMW rears his ugly head. In some form or another, it is the same process used by the most impressive **NR** I have met around the world: dreamlining. Dreamlining is so named because it applies timelines to what most would consider dreams.

It is much like goal-setting but differs in several fundamental respects:

1. The goals shift from ambiguous wants to defined steps.
2. The goals have to be unrealistic to be effective.
3. It focuses on activities that will fill the vacuum created when work is removed. *Living* like a millionaire requires *doing* interesting things and not just owning enviable things.

Now it's your turn to think big.

How to Get George Bush Sr. or the CEO of Google on the Phone

The article below, titled "Fail Better" and written by Adam Gottesfeld, explores how I teach Princeton students to connect with luminary-level business mentors and celebrities of various types. I've edited it for length in a few places.

People are fond of using the "it's not what you know, it's who you know" adage as an excuse for inaction, as if all successful people are born with powerful friends.

Nonsense.

Here's how normal people build supernormal networks.

Fail Better

BY ADAM GOTTESFELD

MOST PRINCETON students love to procrastinate in writing their dean's date [term] papers. Ryan Marrinan '07, from Los Angeles, was no exception. But while the majority of undergraduates fill their time by updating their Facebook profiles or watching videos on YouTube, Marrinan was discussing Soto Zen Buddhism via e-mail with Randy Komisar, a partner at the venture capital firm Kleiner Perkins Caufield and Byers, and asking Google CEO Eric Schmidt via e-mail when he had been happiest in his life. (Schmidt's answer: "Tomorrow.")

Prior to his e-mail, Marrinan had never contacted Komisar. He had met Schmidt, a Princeton University trustee, only briefly at an academic affairs meeting of the trustees in November. A self-described "naturally shy kid," Marrinan said he would never have dared to randomly e-mail two of the most powerful men in Silicon Valley if it weren't for Tim Ferriss, who offered a guest lecture in

Professor Ed Zschau's "High-Tech Entrepreneurship" class. Ferriss challenged Marrinan and his fellow seniors to contact high-profile celebrities and CEOs and get their answers to questions they have always wanted to ask.

For extra incentive, Ferriss promised the student who could contact the most hard-to-reach name and ask the most intriguing question a round-trip plane ticket anywhere in the world.

"I believe that success can be measured in the number of uncomfortable conversations you're willing to have. I felt that if I could help students overcome the fear of rejection with cold-calling and cold e-mail, it would serve them forever," Ferriss said. "It's easy to sell yourself short, but when you see classmates getting responses from people like [former president] George Bush, the CEOs of Disney, Comcast, Google, and HP, and dozens of other impossible-to-reach people, it forces you to reconsider your self-set limitations." ... Ferriss lectures to the students of "High-Tech Entrepreneurship" each semester about creating a startup and designing the ideal lifestyle.

"I participate in this contest every day," said Ferriss. "I do what I always do: find a personal e-mail if possible, often through their little-known personal blogs, send a two- to three-paragraph e-mail which explains that I am familiar with their work, and ask one simple-to-answer but thought-provoking question in that e-mail related to their work or life philosophies. The goal is to start a dialogue so they take the time to answer future e-mails—not to ask for help. That can only come after at least three or four genuine e-mail exchanges."

With "textbook execution of the Tim Ferriss Technique," as he put it, Marrinan was able to strike up a bond with Komisar. In his initial e-mail, he talked about reading one of Komisar's *Harvard Business Review* articles and feeling inspired to ask him, "When were you happiest in your life?" After Komisar replied with references to Tibetan Buddhism, Marrinan responded, "Just as words are inadequate to explain true happiness, so too are words inadequate to express my thanks." His e-mail included his personal translation of a French poem by Taisen Deshimaru, the former European head of Soto Zen. An e-mail relationship was formed, and Komisar even e-mailed Marrinan a few days later with a link to a *New York Times* article on happiness.

Contacting Schmidt proved more challenging. For Marrinan, the toughest part was getting Schmidt's personal e-mail address. He e-mailed a Princeton dean asking for it. No response. Two weeks later, he e-mailed the same dean again, defending his request by reminding her that he had previously met Schmidt. The dean said no, but Marrinan refused to give up. He e-mailed her a third time. "Have you ever made an exception?" he asked. The dean finally gave in, he said, and provided him with Schmidt's e-mail.

"I know some of my classmates pursued the alternative scattershot technique with some success, but that's not my bag," Marrinan said, explaining his perseverance. "I deal with rejection by persisting, not by taking my business elsewhere. My maxim comes from Samuel Beckett, a personal hero of mine: 'Ever tried. Ever failed. No matter. Try again. Fail again. Fail better.' You won't believe what you can accomplish by attempting the impossible with the courage to repeatedly fail better."

Nathan Kaplan, another participant in the contest, was most proud of the way that he was able to contact former Newark mayor Sharpe James. Because James had made a campaign contribution to Al Sharpton, the website www.fundrace.org listed James's home address. Kaplan then input James's address into an online serach-by-address phone directory, through which he received the former mayor's phone number. Kaplan left a message for James, and a few days later finally got to ask him about childhood education.

Ferriss is proud of the effort students have put into his contest. "Most people can do absolutely awe-inspiring things," he said. "Sometimes they just need a little nudge."

► Q&A: QUESTIONS AND ACTIONS

The existential vacuum manifests itself mainly in a state of boredom.

—VIKTOR FRANKL, Auschwitz survivor and founder of Logotherapy, *Man's Search for Meaning*

Life is too short to be small.

—BENJAMIN DISRAELI

Dreamlining will be fun, and it will be hard. The harder it is, the more you need it. To save time, I recommend using the automatic calculators and forms at www.fourhourblog.com. Refer to the model worksheet as you complete the following steps:

1. **What would you do if there were no way you could fail? If you were 10 times smarter than the rest of the world?**
Create two timelines—6 months and 12 months—and list up to five things you dream of *having* (including, but not limited to, material wants: house, car, clothing, etc.), *being* (be a great cook, be fluent in Chinese, etc.), and *doing* (visiting Thailand, tracing your roots overseas, racing ostriches, etc.) in that order. If you have difficulty identifying what you want in some categories, as most will, consider what you hate or fear in each and write down the opposite. Do not limit yourself, and do not concern yourself with how these things will be accomplished. For now, it's unimportant. This is an exercise in reversing repression.

Be sure not to judge or fool yourself. If you really want a Ferrari, don't put down solving world hunger out of guilt. For some, the dream will be fame, for others fortune or prestige. All people have their vices and insecurities. If something will improve your feeling of self-worth, put it down. I have a racing motorcycle, and quite apart from the fact that I love speed, it just makes me feel like a cool dude. There is nothing wrong with that. Put it all down.

2. **Drawing a blank?**
For all their bitching about what's holding them back, most people have a lot of trouble coming up with the defined dreams they're being held from. This is particularly true with the "doing" category. In that case, consider these questions:

1. What would you do, day to day, if you had $100 million in the bank?
2. What would make you most excited to wake up in the morning to another day?

Don't rush—think about it for a few minutes. If still blocked, fill in the five "doing" spots with the following:

one place to visit
one thing to do before you die (a memory of a lifetime)
one thing to do daily
one thing to do weekly
one thing you've always wanted to learn

3. **What does "being" entail doing?**
Convert each "being" into a "doing" to make it actionable. Identify an action that would characterize this state of being or a task that would mean you had achieved it. People find it easier to brainstorm "being" first, but this column is just a temporary holding spot for "doing" actions. Here are a few examples:

Great cook ➡ make Christmas dinner without help

Fluent in Chinese ➡ have a five-minute conversation with a Chinese co-worker

4. **What are the four dreams that would change it all?**
Using the 6-month timeline, star or otherwise highlight the four most exciting and/or important dreams from all columns. Repeat the process with the 12-month timeline if desired.

5. **Determine the cost of these dreams and calculate your Target Monthly Income (TMI) for both timelines.**
If financeable, what is the cost per month for each of the four dreams (rent, mortgage, payment plan installments, etc.)? Start thinking of income and expense in terms of monthly cash flow—dollars in and dollars out—instead of grand totals. Things often cost much, much less than expected. For example, a Lamborghini Gallardo Spyder, fresh off the showroom floor at $260,000, can be had for $2,897.80 per month. I found my personal favorite, an Aston Martin DB9 with 1,000 miles on it, through eBay for $136,000—$2,003.10 per month. How about a Round-the-World trip (Los Angeles . . . Tokyo . . . Singapore . . . Bangkok . . . Delhi or Bombay . . . London . . . Frankfurt . . . Los Angeles) for $1,399?

For some of these costs, the Tools and Tricks at the end of Chapter 14 will help.

Last, calculate your Target Monthly Income (TMI) for realizing these dreamlines. This is how to do it: First, total each of the columns A, B, and C, counting only the four selected dreams. Some of these column totals could be zero, which is fine. Next, add your total monthly expenses **x** 1.3 (the 1.3 represents your expenses plus a 30% buffer for safety or savings). This grand total is your TMI and the target to keep in mind for the rest of the book. I like to further divide this TMI by 30 to get my TDI—Target Daily Income. I find it easier to work with a daily goal. Online calculators on our companion site do all the work for you and make this step a cinch.

Chances are that the figure is lower than expected, and it often decreases over time as you trade more and more "having" for once-in-a-lifetime "doing." Mobility encourages this trend. Even if the total is intimidating, don't fret in the least. I have helped students get to more than $10,000 per month in extra income within three months.

Sample Dreamline

IN 6 MONTHS I DREAM OF:

STEP 1: HAVING

* 1. Aston Martin DB9
2. Go Board from 1800s
* 3. Personal assistant
4. full Kendo armor
5.

STEP 5: COST

1. $2,005/month
2.
3. $5/hr. x 80 = $400
4.
5.

A = $2,405

STEP 2: BEING

1. flexible →
* 2. best-selling author →
3. fluent in Greek →
4. excellent cook →
5. →

STEP 4: DOING

1. full side splits
2. sell 20,000 per week
3. have 15-minute conversation w/native
4. make Thanksgiving dinner for six people
5.

STEP 5: COST

1.
2. $0 (3 free interns for media calls & own time)
3.
4.
5.

B = $0

STEP 3: DOING

1. sell a TV show
* 2. visit Croatian coast
3. find smart & gorgeous girlfriend
4.
5.

STEP 5: COST

1.
2. $519 roundtrip airfare, $420 rent
3.
4.
5.

C = $939

TARGET MONTHLY INCOME

A + B + C + (1.3 x monthly expenses)
=
TMI: $3,357 + ($2,600) = $5,957
÷ 30
=
TDI: $197.90

STEPS NOW

1. Find showroom, schedule test drive
2. Post bullet-point job description on 3 major sites
3. Send top 3 questions to five best-selling authors from 2–3 years ago
4. Visit Virtual Tourist and determine best season and to-do top 5

TOMORROW

1. Take test drive
2. Assign 1- to 2-hour task to top 3
3. Formulate plan around responses (marketing/PR)
4. Research tickets & housing for 3 weeks and invite friend to go

DAY AFTER

1. Decide on desired details & extras
2. Choose top 1 for 20 hrs. per week
3. Send intern recruitment e-mail to nearby college English departments
4. Reserve tickets (for yourself even if friend refuses)

Dreamline

(Go to www.fourhourblog.com for larger printable worksheets and online calculators.)

IN MONTHS I DREAM OF:

STEP 1: HAVING

1.
2.
3.
4.
5.

STEP 5: COST

1.
2.
3.
4.
5.

A =

STEP 2: BEING

1.
2.
3.
4.
5.

STEP 4: DOING

1.
2.
3.
4.
5.

STEP 5: COST

1.
2.
3.
4.
5.

B =

STEP 3: DOING

1.
2.
3.
4.
5.

STEP 5: COST

1.
2.
3.
4.
5.

C =

TARGET MONTHLY INCOME

A + B + C + (1.3 x monthly expenses)
=
TMI:
÷ 30
=
TDI:

STEPS NOW

1.
2.
3.
4.

TOMORROW

1.
2.
3.
4.

DAY AFTER

1.
2.
3.
4.

Dreamline Math—Another Good Option

There could be a different way of handling monthly and one-time goals. I'll use your example of an Aston Martin's monthly payment, a personal assistant's monthly payment, and a trip to the Croatian coast. While the first two should certainly be totaled and included in your target monthly income, the trip is something that should be divided by the number of months between now and the dreamline's total time.

Thus if you had a six-month dreamline:

Aston Martin = 2,003 per month
Personal assistant = 400 per month
Croatian trip = 934 total, and thus 934/6 per month

Right now in the book and in the spreadsheet we have (2003 + 400 + 934) **x** 1.3 monthly expenses = Target Monthly Income (or TMI).

But I think it should be (2003 + 400 + 934/6 **x** 1.3 monthly expenses = TMI.

Or, more generally: [Monthly Goals + (One-Time Goals / Total Months)] **x** 1.3 monthly expenses = TMI.

— ***JARED, president, SET Consulting***

6. **Determine *three steps* for each of the *four dreams* in just the 6-month timeline and take the first step *now*.**

I'm not a big believer in long-term planning and far-off goals. In fact, I generally set 3-month and 6-month dreamlines. The variables change too much and in-the-future distance becomes an excuse for postponing action. The objective of this exercise isn't, therefore, to outline every step from start to finish, but to define the end goal, the required vehicle to achieve them (TMI, TDI), and build momentum with critical first steps. From that point, it's a matter of freeing time and generating the TMI, which the following chapters cover.

First, let's focus on those critical first steps. Define three steps for each dream that will get you closer to its actualization. Set actions—simple, well-defined actions—for now, tomorrow (complete before 11 A.M.) and the day after (again completed before 11 A.M.).

Once you have three steps for each of the four goals, complete the three actions in the "now" column. Do it now. Each should be simple enough to do in five minutes or less. If not, rachet it down. If it's the middle of the night and you can't call someone, do something else now, such as send an e-mail, and set the call for first thing tomorrow.

If the next stage is some form of research, get in touch with someone who knows the answer instead of spending too much time in books or online, which can turn into paralysis by analysis. The best first step, the one I recommend, is finding someone who's done it and ask for advice on how to do the same. It's not hard.

Other options include setting a meeting or phone call with a trainer, mentor, or salesperson to build momentum. Can you schedule a private class or a commitment that you'll feel bad about canceling? Use guilt to your advantage.

Tomorrow becomes never. No matter how small the task, take the first step now!

► COMFORT CHALLENGE

The most important actions are never comfortable.

Fortunately, it is possible to condition yourself to discomfort and overcome it. I've trained myself to propose solutions instead of ask for them, to elicit desired responses instead of react, and to be assertive without burning bridges. To have an uncommon lifestyle, you need to *develop the uncommon habit of making decisions, both for yourself and for others*.

From this chapter forward, I'll take you through progressively more uncomfortable exercises, simple and small. Some of the exercises will appear deceptively easy and even irrelevant (such as the next) until you try them. Look at it as a game and expect some butterflies and sweat—that's the whole point. For most of these exercises, the duration is two days. Mark the exercise of the day on your calendar so you don't forget, and don't attempt more than one Comfort Challenge at a time.

Remember: There is a direct correlation between an increased sphere of comfort and getting what you want.

Here we go.

Learn to Eye Gaze (2 days)

My friend Michael Ellsberg invented a singles event called Eye Gazing. It is similar to speed dating but different in one fundamental respect—no speaking is permitted. It involves gazing into the eyes of each partner for three minutes at a time. If you go to such an event, it becomes clear how uncomfortable most people are doing this. For the next two days, practice gazing into the eyes of others—whether people you pass on the street or conversational partners—until they break contact. Hints:

1. Focus on one eye and be sure to blink occasionally so you don't look like a psychopath or get your ass kicked.
2. In conversation, maintain eye contact when you are speaking. It's easy to do while listening.
3. Practice with people bigger or more confident than yourself. If a passerby asks you what the hell you're staring at, just smile and respond, "Sorry about that. I thought you were an old friend of mine."

Step II:
E is for Elimination

One does not accumulate but eliminate . It is not daily increase but daily decrease. The height of cultivation always runs to simplicity .

—BRUCE LEE

5

The End of Time Management

► ILLUSIONS AND ITALIANS

Perfection is not when there is no more to add, but no more to take away.

—ANTOINE DE SAINT-EXUPÉRY, pioneer of international postal flight and author of *Le Petit Prince (The Little Prince)*

It is vain to do with more what can be done with less.

—WILLIAM OF OCCAM (1300–1350), originator of "Occam's Razor"

Just a few words on time management: Forget all about it.

In the strictest sense, you shouldn't be trying to do more in each day, trying to fill every second with a work fidget of some type. It took me a long time to figure this out. I used to be very fond of the results-by-volume approach.

Being busy is most often used as a guise for avoiding the few critically important but uncomfortable actions. The options are almost limitless for creating "busyness": You could call a few hundred unqualified sales leads, reorganize your Outlook contacts, walk across the office to request documents you don't really need, or fuss with your BlackBerry for a few hours when you should be prioritizing.

In fact, if you want to move up the ladder in most of corporate America, and assuming they don't really check what you are doing (let's be honest), just run around the office holding a cell phone to your head and carrying papers. Now, that is one busy employee! Give them a raise. Unfortunately for the **NR**, this behavior won't get you out of the office or put you on an airplane to Brazil. Bad dog. Hit yourself with a newspaper and cut it out.

After all, there is a far better option, and it will do more than simply increase your results—it will multiply them. Believe it or not, it is not only possible to accomplish more by doing less, it is mandatory.

Enter the world of elimination.

How You Will Use Productivity

Now that you have defined what you want to do with your time, you have to free that time. The trick,

of course, is to do so while maintaining or increasing your income.

The intention of this chapter, and what you will experience if you follow the instructions, is an increase in personal productivity between 100 and 500%. The *principles* are the same for both employees and entrepreneurs, but the *purpose* of this increased productivity is completely different.

First, the employee. The employee is increasing productivity to increase negotiating leverage for two simultaneous objectives: pay raises and a remote working arrangement.

Recall that, as indicated in the first chapter of this book, the general process of joining the New Rich is **D-E-A-L**, in that order, but that employees intent on remaining employees for now need to implement the process as **D-E-L-A**. The reason relates to environment. They need to **Liberate** themselves from the office environment before they can work ten hours a week, for example, because the expectation in that environment is that you will be in constant motion from 9–5. Even if you produce twice the results you had in the past, if you're working a quarter of the hours of your colleagues, there is a good chance of receiving a pink slip. Even if you work 10 hours a week and produce twice the results of people working 40, the collective request will be, "Work 40 hours a week and produce 8 times the results." This is an endless game and one you want to avoid. Hence the need for **Liberation** first.

If you're an employee, this chapter will increase your value and make it more painful for the company to fire you than to grant raises and a remote working agreement. That is your goal. Once the latter is accomplished, you can drop hours without bureaucratic interference and use the resultant free time to fulfill dreamlines.

The entrepreneur's goals are less complex, as he or she is generally the direct beneficiary of increased profit. The goal is to decrease the amount of work you perform while increasing revenue. This will set the stage for replacing yourself with **Automation**, which in turn permits **Liberation**.

For both tracks, some definitions are in order.

Being Effective vs. Being Efficient

Effectiveness is doing the things that get you closer to your goals. Efficiency is performing a given task (whether important or not) in the most economical manner possible. Being efficient without regard to effectiveness is the default mode of the universe.

I would consider the best door-to-door salesperson efficient—that is, refined and excellent at selling door-to-door without wasting time—but utterly ineffective. He or she would sell more using a better vehicle such as e-mail or direct mail.

This is also true for the person who checks e-mail 30 times per day and develops an elaborate system of folder rules and sophisticated techniques for ensuring that each of those 30 brain farts moves as quickly as possible. I was a specialist at such professional wheel-spinning. It is efficient on some perverse level, but far from effective.

Here are two truisms to keep in mind:

1. Doing something unimportant well does not make it important.
2. Requiring a lot of time does not make a task important.

From this moment forward, remember this: *What* you do is infinitely more important than *how* you do it. Efficiency is still important, but it is useless unless applied to the right things.

To find the right things, we'll need to go to the garden.

Pareto and His Garden: 80/20 and Freedom from Futility

What gets measured gets managed.

—PETER DRUCKER, management theorist, author of 31 books, recipient of Presidential Medal of Freedom

Four years ago, an economist changed my life forever. It's a shame I never had a chance to buy him a drink. My dear Vilfredo died almost 100 years ago.

Vilfredo Pareto was a wily and controversial economist-cum-sociologist who lived from 1848 to 1923. An engineer by training, he started his varied career managing coal mines and later succeeded Léon Walras as the chair of political economy at the University of Lausanne in Switzerland. His seminal work, *Cours d'economie politique*, included a then little-explored "law" of income distribution that would later bear his name: "Pareto's Law" or the "Pareto Distribution," in the last decade also popularly called the "80/20 Principle."

The mathematical formula he used to demonstrate a grossly uneven but predictable distribution of wealth in society—80% of the wealth and income was produced and possessed by 20% of the population—also applied outside of economics. Indeed, it could be found almost everywhere. Eighty percent of Pareto's garden peas were produced by 20% of the peapods he had planted, for example.

Pareto's Law can be summarized as follows: 80% of the outputs result from 20% of the inputs. Alternative ways to phrase this, depending on the context, include:

80% of the consequences flow from 20% of the causes.

80% of the results come from 20% of the effort and time.

80% of company profits come from 20% of the products and customers.

80% of all stock market gains are realized by 20% of the investors and 20% of an individual portfolio.

The list is infinitely long and diverse, and the ratio is often skewed even more severely: 90/10, 95/5, and 99/1 are not uncommon, but the minimum ratio to seek is 80/20.

When I came across Pareto's work one late evening, I had been slaving away with 15-hour days seven days per week, feeling completely overwhelmed and generally helpless. I would wake up before dawn to make calls to the United Kingdom, handle the U.S. during the normal 9–5 day, and then work until near midnight making calls to Japan and New Zealand. I was stuck on a runaway freight train with no brakes, shoveling coal into the furnace for lack of a better option. Faced with certain burnout or giving Pareto's ideas a trial run, I opted for the latter. The next morning, I began a dissection of my business and personal life through the lenses of two questions:

1. Which 20% of sources are causing 80% of my problems and unhappiness?
2. Which 20% of sources are resulting in 80% of my desired outcomes and happiness?

For the entire day, I put aside everything seemingly urgent and did the most intense truth-baring

analysis possible, applying these questions to everything from my friends to customers and advertising to relaxation activities. Don't expect to find you're doing everything right—the truth often hurts. The goal is to find your inefficiencies in order to eliminate them and to find your strengths so you can multiply them. In the 24 hours that followed, I made several simple but emotionally difficult decisions that literally changed my life forever and enabled the lifestyle I now enjoy.

The first decision I made is an excellent example of how dramatic and fast the ROI of this analytical fat-cutting can be: I stopped contacting 95% of my customers and fired 2%, leaving me with the top 3% of producers to profile and duplicate.

Out of more than 120 wholesale customers, a mere 5 were bringing in 95% of the revenue. I was spending 98% of my time chasing the remainder, as the aforementioned 5 ordered regularly without any follow-up calls, persuasion, or cajoling. In other words, I was working because I felt as though I should be doing something from 9–5. I didn't realize that working every hour from 9–5 isn't the goal; it's simply the structure most people use, whether it's necessary or not. I had a severe case of work-for-work (W4W), the most-hated acronym in the **NR** vocabulary.

All, and I mean 100%, of my problems and complaints came from this unproductive majority, with the exception of two large customers who were simply world-class experts of the "here is the fire I started, now you put it out" approach to business. I put all of these unproductive customers on passive mode: If they ordered, great—let them fax in the order. If not, I would do absolutely no chasing: no phone calls, no e-mail, nothing. That left the two larger customers to deal with, who were professional ball breakers but contributed about 10% to the bottom line at the time.

You'll always have a few of these, and it is a quandary that causes all sorts of problems, not the least of which are self-hatred and depression. Up to that point, I had taken their browbeating, insults, time-consuming arguments, and tirades as a cost of doing business. I realized during the 80/20 analysis that these two people were the source of nearly all my unhappiness and anger throughout the day, and it usually spilled over into my personal time, keeping me up at night with the usual "I should have said X, Y, and Z to that penis" self-flagellation. I finally concluded the obvious: The effect on my self-esteem and state of mind just wasn't worth the financial gain. I didn't need the money for any precise reason, and I had assumed I needed to take it. The customers are always right, aren't they? Part of doing business, right? Hell, no. Not for the **NR**, anyway. I fired their asses and enjoyed every second of it. The first conversation went like this:

Customer: What the &#@$? I ordered two cases and they arrived two days late. [Note: He had sent the order to the wrong person via the wrong medium, despite repeated reminders.] You guys are the most disorganized bunch of idiots I've ever worked with. I have 20 years of experience in this industry, and this is the worst.

Any NR—in this case, me: I will kill you. Be afraid, be very afraid.

I wish. I did rehearse that a million times in my mental theater, but it actually went something more like this:

I'm sorry to hear that. You know, I've been taking your insults for a while now, and it's unfortunate that it seems we won't be able to do business anymore. I'd recommend you take a good look at where this unhappiness and anger is actually coming from. In any case, I wish you well. If you would like to order product, we'll be happy to supply it, but only if you can conduct yourself without profanity and unnecessary insults. You have our fax number. All the best and have a nice day. [Click.]

I did this once via phone and once through e-mail. So what happened? I lost one customer, but the other corrected course and simply faxed orders, again and again and again. Problem solved, minimum

revenue lost. I was immediately 10 times happier.

I then identified the common characteristics of my top-five customers and secured three or so similarly profiled buyers in the following week. Remember, more customers is not automatically more income. More customers is not the goal and often translates into 90% more housekeeping and a paltry 1–3% increase in income. Make no mistake, maximum income from minimal necessary effort (including minimum number of customers) is the primary goal. I duplicated my strengths, in this case my top producers, and focused on increasing the size and frequency of their orders.

The end result? I went from chasing and appeasing 120 customers to simply receiving large orders from 8, with absolutely no pleading phone calls or e-mail haranguing. My monthly income increased from $30K to $60K in four weeks and my weekly hours immediately dropped from over 80 to approximately 15. Most important, I was happy with myself and felt both optimistic and liberated for the first time in over two years.

In the ensuing weeks, I applied the 80/20 Principle to dozens of areas, including the following:

1. Advertising

I identified the advertising that was generating 80% or more of revenue, identified the commonalities among them, and multiplied them, eliminating all the rest at the same time. My advertising costs dropped over 70% and my direct sales income nearly doubled from a monthly $15K to $25K in 8 weeks. It would have doubled immediately had I been using radio, newspapers, or television instead of magazines with long lead times.

2. Online Affiliates and Partners

I fired more than 250 low-yield online affiliates or put them in holding patterns to focus instead on the *two* affiliates who were generating 90% of the income. My management time decreased from 5–10 hours per week to 1 hour per month. Online partner income increased more than 50% in that same month.

Slow down and remember this: Most things make no difference. *Being busy is a form of laziness—lazy thinking and indiscriminate action.*

Being overwhelmed is often as unproductive as doing nothing, and is far more unpleasant. Being selective—doing less—is the path of the productive. Focus on the important few and ignore the rest.

Of course, before you can separate the wheat from the chaff and eliminate activities in a new environment (whether a new job or an entrepreneurial venture), you will need to try a lot to identify what pulls the most weight. Throw it all up on the wall and see what sticks. That's part of the process, but it should not take more than a month or two.

It's easy to get caught in a flood of minutiae, and the key to not feeling rushed is remembering that *lack of time is actually lack of priorities*. Take time to stop and smell the roses, or—in this case—to count the pea pods.

The 9–5 Illusion and Parkinson's Law

I saw a bank that said "24-Hour Banking," but I don't have that much time.

—STEVEN WRIGHT, comedian

If you're an employee, spending time on nonsense is, to some extent, not your fault. There is often no incentive to use time well unless you are paid on commission. The world has agreed to shuffle papers between 9:00 A.M. and 5:00 P.M., and since you're trapped in the office for that period of servitude, you are compelled to create activities to fill that time. Time is wasted because there is so much time available. It's understandable. Now that you have the new goal of negotiating a remote work arrangement instead of just collecting a paycheck, it's time to revisit the status quo and become effective. The best employees have the most leverage.

For the entrepreneur, the wasteful use of time is a matter of bad habit and imitation. I am no exception. Most entrepreneurs were once employees and come from the 9–5 culture. Thus they adopt the same schedule, whether or not they function at 9:00 A.M. or need 8 hours to generate their target income. This schedule is a collective social agreement and a dinosaur legacy of the results-by-volume approach. How is it possible that all the people in the world need exactly 8 hours to accomplish their work? It isn't. 9–5 is arbitrary.

You don't need 8 hours per day to become a legitimate millionaire—let alone have the means to live like one. Eight hours per week is often excessive, but I don't expect all of you to believe me just yet. I know you probably feel as I did for a long time: There just aren't enough hours in the day.

But let's consider a few things we can probably agree on.

Since we have 8 hours to fill, we fill 8 hours. If we had 15, we would fill 15. If we have an emergency and need to suddenly leave work in 2 hours but have pending deadlines, we miraculously complete those assignments in 2 hours.

It is all related to a law that was introduced to me by Ed Zschau in the spring of 2000.

I had arrived to class nervous and unable to concentrate. The final paper, worth a full 25% of the semester's grade, was due in 24 hours. One of the options, and that which I had chosen, was to interview the top executives of a start-up and provide an in-depth analysis of their business model. The corporate powers that be had decided last minute that I couldn't interview two key figures or use their information due to confidentiality issues and pre-IPO precautions. Game over.

I approached Ed after class to deliver the bad news.

"Ed, I think I'm going to need an extension on the paper." I explained the situation, and Ed smiled before he replied without so much as a hint of concern.

"I think you'll be OK. Entrepreneurs are those who make things happen, right?"

Twenty-four hours later and one minute before the deadline, as his assistant was locking the office, I handed in a 30-page final paper. It was based on a different company I had found, interviewed, and dissected with an intense all-nighter and enough caffeine to get an entire Olympic track team disqualified. It ended up being one of the best papers I'd written in four years, and I received an A.

Before I left the classroom the previous day, Ed had given me some parting advice: Parkinson's Law.

Parkinson's Law dictates that a task will swell in (perceived) importance and complexity in relation to the time allotted for its completion. It is the magic of the imminent deadline. If I give you 24 hours to complete a project, the time pressure forces you to focus on execution, and you have no choice but to do only the bare essentials. If I give you a week to complete the same task, it's six days of making a mountain out of a molehill. If I give you two months, God forbid, it becomes a mental monster. The end product of the shorter deadline is almost inevitably of equal or higher quality due to greater focus.

This presents a very curious phenomenon. There are two synergistic approaches for increasing productivity that are inversions of each other:

1. Limit tasks to the important to shorten work time (80/20).

2. Shorten work time to limit tasks to the important (Parkinson's Law).

The best solution is to use both together: Identify the few critical tasks that contribute most to income and schedule them with *very short* and clear deadlines.

If you haven't identified the mission-critical tasks and set aggressive start and end times for their completion, the unimportant becomes the important. Even if you know what's critical, without deadlines that create focus, the minor tasks forced upon you (or invented, in the case of the entrepreneur) will swell to consume time until another bit of minutiae jumps in to replace it, leaving you at the end of the day with nothing accomplished. How else could dropping off a package at UPS, setting a few appointments, and checking e-mail consume an entire 9–5 day? Don't feel bad. I spent months jumping from one interruption to the next, feeling run by my business instead of the other way around.

THE 80/20 PRINCIPLE and Parkinson's Law are the two cornerstone concepts that will be revisited in different forms throughout this entire section. Most inputs are useless and time is wasted in proportion to the amount that is available.

Fat-free performance and time freedom begins with limiting intake overload. In the next chapter, we'll put you on the real breakfast of champions: the Low-Information Diet.

A Dozen Cupcakes and One Question

Love of bustle is not industry.
—SENECA

MOUNTAIN VIEW, CALIFORNIA.

"Saturdays are my days off," I offered to the crowd of strangers staring at me, friends of a friend. It was true. Can you eat All-Bran and chicken seven days a week? Me neither. Don't be so judgmental.

Between my tenth and twelfth cupcakes, I plopped down on the couch to revel in the sugar high until the clock struck midnight and sent me back to my adultsville Sunday–Friday diet. There was another party guest seated next to me on a chair, nursing a glass of wine, not his twelfth but certainly not his first, and we struck up a conversation. As usual, I had to struggle to answer "What do you do?" and, as usual, my answer left someone to wonder whether I was a pathological liar or a criminal.

How was it possible to spend so little time on income generation? It's a good question. It's THE question.

In almost all respects, Charney had it all. He was happily married with a two-year-old son and another due to arrive in three months. He was a successful technology salesman, and though he wanted to earn $500,000 more per year as all do, his finances were solid.

He also asked good questions. I had just returned from another trip overseas and was planning a new adventure to Japan. He drilled me for two hours with a refrain: How is it possible to spend so little time on income generation?

"If you're interested, we can make you a case study and I'll show you how," I offered.

Charney was in. The one thing he didn't have was time.

One e-mail and five weeks of practice later, Charney had good news: He had accomplished more in the last week than he had in the previous four combined. He did so while taking Monday and Friday off

and spending at least 2 more hours per day with his family. From 40 hours per week, he was down to 18 and producing four times the results.

Was it from mountaintop retreats and secret kung fu training? Nope. Was it a new Japanese management secret or better software? Nein. I just asked him to do one simple thing consistently without fail.

At least three times per day at scheduled times, he had to ask himself the following question:

Am I being productive or just active?

Charney captured the essence of this with less-abstract wording:

Am I inventing things to do to avoid the important?

He eliminated all of the activities he used as crutches and began to focus on demonstrating results instead of showing dedication. Dedication is often just meaningless work in disguise. Be ruthless and cut the fat.

It is possible to have your cupcake and eat it, too.

► Q&A: QUESTIONS AND ACTIONS

> We create stress for ourselves because you feel like you have to do it. You *have* to. I don't feel that anymore.
>
> —OPRAH WINFREY, actress and talk-show host, *The Oprah Winfrey Show*

The key to having more time is doing less, and there are two paths to getting there, both of which should be used together: (1) Define a to-do list and (2) define a not-to-do list. In general terms, there are but two questions:

What 20% of sources are causing 80% of my problems and unhappiness?

What 20% of sources are resulting in 80% of my desired outcome and happiness?

Hypothetical cases help to get us started:

1. **If you had a heart attack and had to work two hours per day, what would you do?**
Not five hours, not four hours, not three—two hours. It's not where I want you to ultimately be, but it's a start. Besides, I can hear your brain bubbling already: That's ridiculous. Impossible! I know, I know. If I told you that you could survive for months, functioning quite well, on four hours of sleep per night, would you believe me? Probably not. Notwithstanding, millions of new mothers do it all the time. This exercise is not optional. The doctor has warned you, after triple-bypass surgery, that if you don't cut down your work to two hours per day for the first three months post-op, you will die. How would you do it?

2. **If you had a second heart attack and had to work two hours per *week*, what would you do?**

3. **If you had a gun to your head and *had* to stop doing 4/5 of different time-consuming activities, what would you remove?** Simplicity requires ruthlessness. If you had to stop 4/5 of time-consuming

activities—e-mail, phone calls, conversations, paperwork, meetings, advertising, customers, suppliers, products, services, etc.—what would you eliminate to keep the negative effect on income to a minimum? Used even once per month, this question alone can keep you sane and on track.

4. **What are the top-three activities that I use to fill time to feel as though I've been productive?** These are usually used to postpone more important actions (often uncomfortable because there is a chance of failure or rejection). Be honest with yourself, as we all do this on occasion. What are your crutch activities?

5. **Who are the 20% of people who produce 80% of your enjoyment and propel you forward, and which 20% cause 80% of your depression, anger, and second-guessing?**
Identify:

- ► Positive friends versus time-consuming friends: Who is helping versus hurting you, and how do you increase your time with the former while decreasing or eliminating your time with the latter?

- ► Who is causing me stress disproportionate to the time I spend with them? What will happen if I simply stop interacting with these people? Fear-setting helps here.

- ► When do I feel starved for time? What commitments, thoughts, and people can I eliminate to fix this problem?

Exact numbers aren't needed to realize that we spend too much time with those who poison us with pessimism, sloth, and low expectations of themselves and the world. It is often the case that you have to fire certain friends or retire from particular social circles to have the life you want. This isn't being mean; it is being practical. Poisonous people do not deserve your time. To think otherwise is masochistic.

The best way to approach a potential break is simple: Confide in them honestly but tactfully and explain your concerns. If they bite back, your conclusions have been confirmed. Drop them like any other bad habit. If they promise to change, first spend at least two weeks apart to develop other positive influences in your life and diminish psychological dependency. The next trial period should have a set duration and consist of pass-or-fail criteria.

If this approach is too confrontational for you, just politely refuse to interact with them. Be in the middle of something when the call comes, and have a prior commitment when the invitation to hang out comes. Once you see the benefits of decreased time with these people, it will be easier to stop communication altogether.

I'm not going to lie: It sucks. It hurts like pulling out a splinter. But you are the average of the five people you associate with most, so do not underestimate the effects of your pessimistic, unambitious, or disorganized friends. If someone isn't making you stronger, they're making you weaker.

Remove the splinters and you'll thank yourself for it.

6. **Learn to ask, "If this is the only thing I accomplish today, will I be satisfied with my day?"** Don't ever arrive at the office or in front of your computer without a clear list of priorities. You'll just read unassociated e-mail and scramble your brain for the day. Compile your to-do list for tomorrow no

later than this evening. I don't recommend using Outlook or computerized to-do lists, because it is possible to add an infinite number of items. I use a standard piece of paper folded in half three times, which fits perfectly in the pocket and limits you to noting only a few items.

There should never be more than two mission-critical items to complete each day. Never. It just isn't necessary if they're actually high-impact. If you are stuck trying to decide between multiple items that all seem crucial, as happens to all of us, look at each in turn and ask yourself, *If this is the only thing I accomplish today, will I be satisfied with my day?*

To counter the seemingly urgent, ask yourself: What will happen if I don't do this, and is it worth putting off the important to do it? If you haven't already accomplished at least one important task in the day, don't spend the last business hour returning a DVD to avoid a $5 late charge. Get the important task done and pay the $5 fine.

7. **Put a Post-it on your computer screen or set an Outlook reminder to alert you at least three times daily with the question: Are you inventing things to do to avoid the important?**
I also use free time-tracking software called RescueTime (www.rescuetime.com) to alert me when I spend more than an allotted time on certain websites or programs often used to avoid the important (Gmail, Facebook, Outlook, etc.). It also summarizes your time use each week and compares your performance to peers.

8. **Do not multitask**.
I'm going to tell you what you already know. Trying to brush your teeth, talk on the phone, and answer e-mail at the same time just doesn't work. Eating while doing online research and instant messaging? Ditto.

If you prioritize properly, there is no need to multitask. It is a symptom of "task creep"—doing more to feel productive while actually accomplishing less. As stated, you should have, at most, two primary goals or tasks per day. Do them separately from start to finish without distraction. Divided attention will result in more frequent interruptions, lapses in concentration, poorer net results, and less gratification.

9. **Use Parkinson's Law on a Macro and Micro Level**.
Use Parkinson's Law to accomplish more in less time. Shorten schedules and deadlines to necessitate focused action instead of deliberation and procrastination.

On a weekly and daily macro level, attempt to take Monday and/or Friday off, as well as leave work at 4 P.M. This will focus you to prioritize more effectively and quite possibly develop a social life. If you're under the hawklike watch of a boss, we'll discuss the nuts and bolts of how to escape in later chapters.

On a micro task level, limit the number of items on your to-do list and use impossibly short deadlines to force immediate action while ignoring minutiae.

If doing work online or near an online computer, http://e.ggtimer.com/ is a convenient countdown timer. Just type the desired time limit directly into the URL field and hit enter. The http:// can often be omitted. For example:

http://e.ggtimer.com/5minutes (or just "e.ggtimer.com/5min"insomebrowsers)

http://e.ggtimer.com/1hour30minutes30seconds

http://e.ggtimer.com/30 (if you just put in a number, it assumes seconds)

► COMFORT CHALLENGE

Learn to Propose (2 Days)

Stop asking for opinions and start proposing solutions. Begin with the small things. If someone is going to ask, or asks, "Where should we eat?" "What movie should we watch?" "What should we do tonight?" or anything similar, do NOT reflect it back with, "Well, what do you want to … ?" *Offer a solution*. Stop the back-and-forth and make a decision. Practice this in both personal and professional environments. Here are a few lines that help (my favorites are the first and last):

"Can I make a suggestion?"

"I propose …"

"I'd like to propose …"

"I suggest that … What do you think?"

"Let's try … and then try something else if that doesn't work."

► LIFESTYLE DESIGN IN ACTION

I'm a musician who got your book because Derek Sivers at CD Baby recommended it. Checking Pareto's Law I realized that 78% of my downloads came from just one of my CDs and that 55% of my total download income came from only five songs! It showed me what my fans are looking for and allowed me to showcase those on my web site. Downloads are the way to go. iTunes sells the song and CD Baby direct deposits it to my account. Fully automated once the recording is done. There are some months I can live off download income. Once I finish paying off debt, it should be no problem to travel as an artist and create new fans all over the world and have a cyber income stream.

—VICTOR JOHNSON

• • •

As for "outsourcing" your banking, any company that needs to take checks (cheques) should consider a lock box solution. Just about any bank that does business banking offers it. All checks go to a PO box at the bank, the bank processes the checks and deposits them, and according to your instructions can send you a file of all the checks that are deposited. Normally this can be done in either a flat, Excel or other file type that can interface with any accounting systems from Excel, to Quicken to SAP. Quite cost effective.

—ANONYMOUS

6
The Low-Information Diet

► CULTIVATING SELECTIVE IGNORANCE

> What information consumes is rather obvious: it consumes the attention of its recipients. Hence, a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.
>
> —HERBERT SIMON, recipient of Nobel Memorial Prize in Economics[8] and the A.M. Turing Award, the "Nobel Prize of Computer Science"

> Reading, after a certain age, diverts the mind too much from its creative pursuits. Any man who reads too much and uses his own brain too little falls into lazy habits of thinking.
>
> —ALBERT EINSTEIN

I hope you're sitting down. Take that sandwich out of your mouth so you don't choke. Cover the baby's ears. I'm going to tell you something that upsets a lot of people.

I never watch the news and have bought one single newspaper in the last five years, in Stansted Airport in London, and only because it gave me a discount on a Diet Pepsi.

I would claim to be Amish, but last time I checked, Pepsi wasn't on the menu.

How obscene! I call myself an informed and responsible citizen? How do I stay up-to-date with current affairs? I'll answer all of that, but wait—it gets better. I usually check business e-mail for about an hour each Monday, and I never check voicemail when abroad. Never ever.

But what if someone has an emergency? It doesn't happen. My contacts now know that I don't respond to emergencies, so the emergencies somehow don't exist or don't come to me. Problems, as a rule, solve themselves or disappear if you remove yourself as an information bottleneck and empower others.

Cultivating Selective Ignorance

> There are many things of which a wise man might wish to be ignorant.
>
> —RALPH WALDO EMERSON (1803–1882)

From this point forward, I'm going to propose that you develop an uncanny ability to be selectively ignorant. Ignorance may be bliss, but it is also practical. It is imperative that you learn to ignore or redirect all information and interruptions that are irrelevant, unimportant, or unactionable. Most are all three.

The first step is to develop and maintain a low-information diet. Just as modern man consumes both too many calories and calories of no nutritional value, information workers eat data both in excess and from the wrong sources.

Lifestyle design is based on massive action—output. Increased output necessitates decreased input. Most information is time-consuming, negative, irrelevant to your goals, and outside of your influence. I challenge you to look at whatever you read or watched today and tell me that it wasn't at least two of the four.

HOUSE_OVERSIGHT_013850

I read the front-page headlines through the newspaper machines as I walk to lunch each day and nothing more. In five years, I haven't had a single problem due to this selective ignorance. It gives you something new to ask the rest of the population in lieu of small talk: "Tell me, what's new in the world?" And, if it's that important, you'll hear people talking about it. Using my crib notes approach to world affairs, I also retain more than someone who loses the forest for the trees in a sea of extraneous details.

From an actionable information standpoint, I consume a maximum of one-third of one industry magazine *(Response* magazine) and one business magazine *(Inc.)* per month, for a grand total of approximately four hours. That's it for results-oriented reading. I read an hour of fiction prior to bed for relaxation.

How on earth do I act responsibly? Let me give an example of how I and other **NR** both consider and obtain information. I voted in the last presidential election,[9] despite having been in Berlin. I made my decision in a matter of hours. First, I sent e-mails to educated friends in the U.S. who share my values and asked them who they were voting for and why. Second, I judge people based on actions and not words; thus, I asked friends in Berlin, who had more perspective outside of U.S. media propaganda, how they judged the candidates based on their historical behavior. Last, I watched the presidential debates. That was it. I let other dependable people synthesize hundreds of hours and thousands of pages of media for me. It was like having dozens of personal information assistants, and I didn't have to pay them a single cent.

That's a simple example, you say, but what if you need to learn to do something your friends haven't done? Like, say, sell a book to the world's largest publisher as a first-time author? Funny you should ask. There are two approaches I used:

1. I picked one book out of dozens based on reader reviews and the fact that the authors had actually done what I wanted to do. If the task is how-to in nature, I only read accounts that are "how I did it" and autobiographical. No speculators or wannabes are worth the time.

2. Using the book to generate intelligent and specific questions, I contacted 10 of the top authors and agents in the world via e-mail and phone, with a response rate of 80%.

I only read the sections of the book that were relevant to immediate next steps, which took less than two hours. To develop a template e-mail and call script took approximately four hours, and the actual e-mails and phone calls took less than an hour. This personal contact approach is not only more effective and more efficient than all-you-can-eat info buffets, it also provided me with the major league alliances and mentors necessary to sell this book. Rediscover the power of the forgotten skill called "talking." It works.

Once again, less is more.

How to Read 200% Faster in 10 Minutes

There will be times when, it's true, you will have to read. Here are four simple tips that will lessen the damage and increase your speed at least 200% in 10 minutes with no comprehension loss:

1. ***Two Minutes:*** **Use a pen or finger to trace under each line as you read as fast as possible**. Reading is a series of jumping snapshots (called saccades), and using a visual guide prevents regression.

2. *Three Minutes:* **Begin each line focusing on the third word in from the first word, and end each line focusing on the third word in from the last word**. This makes use of peripheral vision that is otherwise wasted on margins. For example, even when the highlighted words in the next line are your beginning and ending focal points, the entire sentence is "read," just with less eye movement:

"Once upon **a** time, an information addict **decided** to detox."

Move in from both sides further and further as it gets easier.

3. *Two Minutes:* **Once comfortable indenting three or four words from both sides, attempt to take only two snapshots—also known as fixations—per line on the first and last indented words.**

4. *Three Minutes:* **Practice reading too fast for comprehension but with good technique (the above three techniques) for five pages prior to reading at a comfortable speed**. This will heighten perception and reset your speed limit, much like how 50 mph normally feels fast but seems like slow motion if you drop down from 70 mph on the freeway.

To calculate reading speed in words per minute (wpm)—and thus progress—in a given book, add up the number of words in ten lines and divide by ten to get the average words per line. Multiply this by the number of lines per page and you have the average words per page. Now it's simple. If you initially read 1.25 pages in one minute at 330 average words per page, that's 412.5 words per minute. If you then read 3.5 pages after training, it's 1,155 words per minute and you're in the top 1% of the world's fastest readers.

► Q&A: QUESTIONS AND ACTIONS

Learning to ignore things is one of the great paths to inner peace.

—ROBERT J. SAWYER, *Calculating God*

1. **Go on an immediate one-week media fast**.

The world doesn't even hiccup, much less end, when you cut the information umbilical cord. To realize this, it's best to use the Band-Aid approach and do it quickly: a one-week media fast. Information is too much like ice cream to do otherwise. "Oh, I'll just have a half a spoonful" is about as realistic as "I just want to jump online for a minute." Go cold turkey.

If you want to go back to the 15,000-calorie potato chip information diet afterward, fine, but beginning tomorrow and for at least five full days, here are the rules:

No newspapers, magazines, audiobooks, or nonmusic radio. Music is permitted at all times.

No news websites whatsoever (cnn.com, drudgereport.com, msn.com,[10] etc.).

No television at all, except for one hour of pleasure viewing each evening.

No reading books, except for this book and one hour of *fiction*[11] pleasure reading prior to bed.

No web surfing at the desk unless it is necessary to complete a work task for *that day*. Necessary means necessary, not nice to have.

Unnecessary reading is public enemy number one during this one-week fast.

What do you do with all the extra time? Replace the newspaper at breakfast with speaking to your spouse, bonding with your children, or learning the principles in this book. Between 9–5, complete your top priorities as per the last chapter. If you complete them with time to spare, do the exercises in this book. Recommending this book might seem hypocritical, but it's not: The information in these pages is both important and to be applied now, not tomorrow or the day after.

Each day at lunch break, and no earlier, get your five-minute news fix. Ask a well-informed colleague or a restaurant waiter, "Anything important happening in the world today? I couldn't get the paper today." Stop this as soon as you realize that the answer doesn't affect your actions at all. Most people won't even remember what they spent one to two hours absorbing that morning.

Be strict with yourself. I can prescribe the medicine, but you need to take it.

Download the Firefox web browser (www.firefox.com) and use **LeechBlock** to block certain sites entirely for set periods. From their site (http://www.proginosko.com/leechblock.html):

You can specify up to six sets of sites to block, with different times and days for each set. You can block sites within fixed time periods (e.g., between 9am and 5pm), after a time limit (e.g., 10 minutes in every hour), or with a combination of time periods and time limit (e.g., 10 minutes in every hour between 9am and 5pm). You can also set a password for access to the extension options, just to slow you down in moments of weakness!

2. **Develop the habit of asking yourself, "Will I definitely use this information for something immediate and important?"**
It's not enough to use information for "something"—it needs to be immediate and important. If "no" on either count, don't consume it. Information is useless if it is not applied to something important or if you will forget it before you have a chance to apply it.

I used to have the habit of reading a book or site to prepare for an event weeks or months in the future, and I would then need to reread the same material when the deadline for action was closer. This is stupid and redundant. Follow your to-do short list and fill in the information gaps as you go.

Focus on what digerati Kathy Sierra calls "just-in-time" information instead of "just-in-case" information.

3. **Practice the art of nonfinishing**.
This is another one that took me a long time to learn. Starting something doesn't automatically justify finishing it.

If you are reading an article that sucks, put it down and don't pick it back up. If you go to a movie and it's worse than *Matrix III*, get the hell out of there before more neurons die. If you're full after half a plate of ribs, put the damn fork down and don't order dessert.

More is not better, and stopping something is often 10 times better than finishing it. Develop the habit of nonfinishing that which is boring or unproductive if a boss isn't demanding it.

► COMFORT CHALLENGE

Get Phone Numbers (2 Days)

Being sure to maintain eye contact, ask for the phone numbers of at least two (the more you attempt, the less stressful it will be) attractive members of the opposite sex on each day. Girls, this means you're in the game as well, and it doesn't matter if you're 50+. Remember that the real goal is not to get numbers, but to get over the fear of asking, so the outcome is unimportant. If you're in a relationship, sign up to

(or pretend to) gather information for Greenpeace. Just toss the numbers if you get them.

Go to a mall if you want to get some rapid-fire practice—my preference for getting over the discomfort quickly—and aim to ask three people in a row within five minutes. Feel free to use some variation of the following script:

"Excuse me. I know this is going to sound strange, but if I don't ask you now, I'll be kicking myself for the rest of the day. I'm running to meet a friend [i.e., I have friends and am not a stalker], but I think you're really [extremely, drop-dead] cute [gorgeous, hot]. Could I have your phone number? I'm not a psycho—I promise. You can give me a fake one if you're not interested."

8. Simon received the Nobel Prize in 1978 for his contribution to organizational decision making: It is impossible to have perfect and complete information at any given time to make a decision.

9. 2004 at the time this was written.

10. LOL.

11. As someone who read exclusively nonfiction for nearly 15 years, I can tell you two things: It's not productive to read two fact-based books at the same time (this is one), and fiction is better than sleeping pills for putting the happenings of the day behind you.

7

Interrupting Interruption and the Art of Refusal

> Do your own thinking independently. Be the chess player, not the chess piece.
>
> —RALPH CHARELL

> Meetings are an addictive, highly self-indulgent activity that corporations and other organizations habitually engage in only because they cannot actually masturbate.
>
> —DAVE BARRY, Pulitzer Prize–winning American humorist

SPRING 2000, PRINCETON , NEW JERSEY

1:35 P.M.

"I think I understand. Moving on. In the next paragraph, it explains that ..." I had detailed notes and didn't want to miss a single point.

3:45 P.M.

"OK. That makes sense, but if we look at the following example ..." I paused for a moment mid-sentence. The teaching assistant had both hands on his face.

"Tim, let's end here for now. I'll be sure to keep these points in mind." He had had enough. Me too,

but I knew I'd only have to do it once.

For all four years of school, I had a policy. If I received anything less than an A on the first paper or non-multiple-choice test in a given class, I would bring 2–3 hours of questions to the grader's office hours and not leave until the other had answered them all or stopped out of exhaustion.

This served two important purposes:

1. I learned exactly how the grader evaluated work, including his or her prejudices and pet peeves.
2. The grader would think long and hard about ever giving me less than an A. He or she would never consider giving me a bad grade without exceptional reasons for doing so, as he or she knew I'd come a'knocking for another three-hour visit.

Learn to be difficult when it counts. In school as in life, having a reputation for being assertive will help you receive preferential treatment without having to beg or fight for it every time.

Think back to your days on the playground. There was always a big bully and countless victims, but there was also that one small kid who fought like hell, thrashing and swinging for the fences. He or she might not have won, but after one or two exhausting exchanges, the bully chose not to bother him or her. It was easier to find someone else.

Be that kid.

Doing the important and ignoring the trivial is hard because so much of the world seems to conspire to force crap upon you. Fortunately, a few simple routine changes make bothering you much more painful than leaving you in peace.

It's time to stop taking information abuse.

Not All Evils Are Created Equal

For our purposes, an interruption is anything that prevents the start-to-finish completion of a critical task, and there are three principal offenders:

1. **Time wasters:** those things that can be ignored with little or no consequence. Common time wasters include meetings, discussions, phone calls, web surfing, and e-mail that are *unimportant*.
2. **Time consumers:** repetitive tasks or requests that need to be completed but often interrupt high-level work. Here are a few you might know intimately: reading and responding to e-mail, making and returning phone calls, customer service (order status, product assistance, etc.), financial or sales reporting, personal errands, all necessary repeated actions and tasks.
3. **Empowerment failures:** instances where someone needs approval to make something small happen. Here are just a few: fixing customer problems (lost shipments, damaged shipments, malfunctions, etc.), customer contact, cash expenditures of all types.

Let's look at the prescriptions for all three in turn.

Time Wasters: Become an Ignoramus

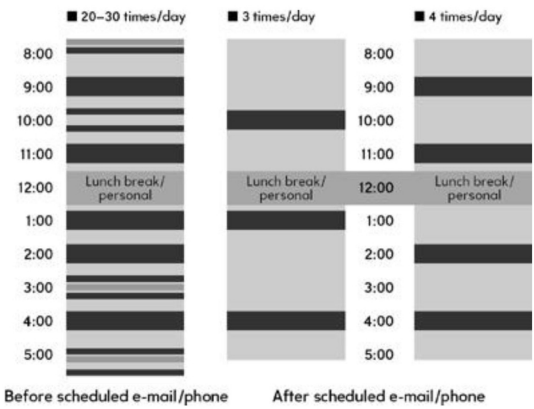
The best defense is a good offense.

—DAN GABLE, Olympic gold medalist in wrestling and the most successful coach in history; personal record: 299–6–3, with 182 pins

Time wasters are the easiest to eliminate and deflect. It is a matter of limiting access and funneling all communication toward immediate action.

First, limit e-mail consumption and production. This is the greatest single interruption in the modern world.

1. Turn off the audible alert if you have one on Outlook or a similar program and turn off automatic send/receive, which delivers e-mail to your inbox as soon as someone sends them.
2. Check e-mail twice per day, once at 12:00 noon or just prior to lunch, and again at 4:00 P.M. 12:00 P.M. and 4:00 P.M. are times that ensure you will have the most responses from previously sent e-mail. Never check e-mail first thing in the morning.[12] Instead, complete your most important task before 11:00 A.M. to avoid using lunch or reading e-mail as a postponement excuse.



LIGHT GRAY INDICATES TIME AVAILABLE FOR HIGH-PRIORITY TASKS . ***Courtesy of SANDIA***

Before implementing the twice-daily routine, you must create an e-mail autoresponse that will train your boss, co-workers, suppliers, and clients to be more effective. I would recommend that you do not ask to implement this. Remember one of our ten commandments: Beg for forgiveness; don't ask for permission.

If this gives you heart palpitations, speak with your immediate supervisor and propose to trial the approach for one to three days. Cite pending projects and frustration with constant interruptions as the reasons. Feel free to blame it on spam or someone outside of the office.

Here is a simple e-mail template that can be used:

Greetings, Friends [or Esteemed Colleagues],

Due to high workload, I am currently checking and responding to e-mail twice daily at 12:00 p.m. ET [or your time zone] and 4:00 p.m. ET.

If you require urgent assistance (please ensure it is urgent) that cannot wait until either 12:00 p.m. or 4:00 p.m., please contact me via phone at 555–555–5555.

Thank you for understanding this move to more efficiency and effectiveness. It helps me accomplish more to serve you better.

Sincerely,

Tim Ferriss

MOVE TO ONCE-PER-DAY as quickly as possible. Emergencies are seldom that. People are poor judges of importance and inflate minutiae to fill time and feel important. This autoresponse is a tool that, far from decreasing collective effectiveness, forces people to re-evaluate their reason for interrupting you and helps them decrease meaningless and time-consuming contact.

I was initially terrified of missing important requests and inviting disaster, just as you might be upon reading this recommendation. Nothing happened. Give it a shot and work out the small bumps as you progress.

For an extreme example of a personal autoresponder that has never prompted a complaint and allowed me to check e-mail once per week, send an e-mail to template@fourhourworkweek.com. It has been revised over three years and works like a charm.

The second step is to screen incoming and limit outgoing phone calls.

1. Use two telephone numbers if possible—one office line (non urgent) and one cellular (urgent). This could also be two cell phones, or the non-urgent line could be an Internet phone number that routes calls to online voicemail (www.skype.com, for example).

Use the cell number in the e-mail autoresponse and answer it at all times unless it is an unknown caller or it is a call you don't want to answer. If in doubt, allow the call to go to voicemail and listen to the voicemail immediately afterward to gauge importance. If it can wait, let it wait. The offending parties have to learn to wait.

The office phone should be put on silent mode and allowed to go to voicemail at all times. The voicemail recording should sound familiar:

You've reached the desk of Tim Ferriss.

I am currently checking and responding to voicemail twice daily at 12:00 p.m. ET [or your time zone] and 4:00 p.m. ET.

If you require assistance with a truly urgent matter that cannot wait until either 12:00 p.m. or 4:00 p.m., please contact me on my cell at 555–555–5555. Otherwise, please leave a message and I will return it at the next of those two times. Be sure to leave your e-mail address, as I am often able to respond faster that way.

Thank you for understanding this move to more efficiency and effectiveness. It helps me accomplish more to serve you better.

Have a wonderful day.

2. If someone does call your cell phone, it is presumably urgent and should be treated as such. Do not

allow them to consume time otherwise. It's all in the greeting. Compare the following:

Jane (receiver)**:** Hello?

John (caller)**:** Hi, is this Jane?

Jane: This is Jane.

John: Hi, Jane, it's John.

Jane: Oh, hi, John. How are you? (or) Oh, hi, John. What's going on?

John will now digress and lead you into a conversation about nothing, from which you will have to recover and then fish out the ultimate purpose of the call. There is a better approach:

Jane: This is Jane speaking.

John: Hi, it's John.

Jane: Hi, John. I'm right in the middle of something. How can I help you out?

Potential continuation:

John: Oh, I can call back.

Jane: No, I have a minute. What can I do for you?

Don't encourage people to chitchat and don't let them chitchat. Get them to the point immediately. If they meander or try to postpone for a later undefined call, reel them in and get them to come to the point. If they go into a long description of a problem, cut in with, "[Name], sorry to interrupt, but I have a call in five minutes. What can I do to help out?" You might instead say, "[Name], sorry to interrupt, but I have a call in five minutes. Can you send me an e-mail?"

The third step is to master the art of refusal and avoiding meetings.

THE FIRST DAY our new Sales VP arrived at TrueSAN in 2001, he came into the all-company meeting and made an announcement in just about this many words: "I am not here to make friends. I have been hired to build a sales team and sell product, and that's what I intend to do. Thanks." So much for small talk.

He proceeded to deliver on his promise. The office socializers disliked him for his no-nonsense approach to communication, but everyone respected his time. He wasn't rude without reason, but he was direct and kept the people around him focused. Some didn't consider him charismatic, but no one considered him anything less than spectacularly effective.

I remember sitting down in his office for our first one-on-one meeting. Fresh off four years of rigorous academic training, I immediately jumped into explaining the prospect profiles, elaborate planning I'd developed, responses to date, and so forth and so on. I had spent at least two hours preparing to make this first impression a good one. He listened with a smile on his face for no more than two minutes and then held up a hand. I stopped. He laughed in a kind-hearted manner and said, "Tim, I don't want the story. Just tell me what we need to do."

Over the following weeks, he trained me to recognize when I was unfocused or focused on the wrong things, which meant anything that didn't move the top two or three clients one step closer to signing a

purchase order. Our meetings were now no more than five minutes long.

From this moment forward, resolve to keep those around you focused and avoid all meetings, whether in person or remote, that do not have clear objectives. It is possible to do this tactfully, but expect that some time wasters will be offended the first few times their advances are rejected. Once it is clear that remaining on task is your policy and not subject to change, they will accept it and move on with life. Hard feelings pass. Don't suffer fools or you'll become one.

It is your job to train those around you to be effective and efficient. No one else will do it for you. Here are a few recommendations:

1. Decide that, given the non-urgent nature of most issues, you will steer people toward the following means of communication, in order of preference: e-mail, phone, and in-person meetings. If someone proposes a meeting, request an e-mail instead and then use the phone as your fallback offer if need be. Cite other immediately pending work tasks as the reason.

2. Respond to voicemail via e-mail whenever possible. This trains people to be concise. Help them develop the habit.

Similar to our opening greeting on the phone, e-mail communication should be streamlined to prevent needless back-and-forth. Thus, an e-mail with "Can you meet at 4:00 P.M.?" would become "Can you meet at 4:00 P.M.? If so If not, please advise three other times that work for you."

This "if … then" structure becomes more important as you check e-mail less often. Since I only check e-mail once a week, it is critical that no one needs a "what if?" answered or other information within seven days of a given e-mail I send. If I suspect that a manufacturing order hasn't arrived at the shipping facility, for example, I'll send an e-mail to my shipping facility manager along these lines: "Dear Susan … Has the new manufacturing shipment arrived? If so, please advise me on … If not, please contact John Doe at 555–5555 or via e-mail at john@doe.com (he is also CC'd) and advise on delivery date and tracking. John, if there are any issues with the shipment, please coordinate with Susan, reachable at 555–4444, who has the authority to make decisions up to $500 on my behalf. In case of emergency, call me on my cell phone, but I trust you two. Thanks." This prevents most follow-up questions, avoids two separate dialogues, and takes me out of the problem-solving equation.

Get into the habit of considering what "if … then" actions can be proposed in any e-mail where you ask a question.

3. Meetings should only be held to make decisions about a predefined situation, not to define the problem. If someone proposes that you meet with them or "set a time to talk on the phone," ask that person to send you an e-mail with an agenda to define the purpose:

> That sounds doable. So I can best prepare, can you please send me an e-mail with an agenda? That is, the topics and questions we'll need to address? That would be great. Thanks in advance.

Don't give them a chance to bail out. The "thanks in advance" before a retort increases your chances of getting the e-mail.

The e-mail medium forces people to define the desired outcome of a meeting or call. Nine times out of ten, a meeting is unnecessary and you can answer the questions, once defined, via e-mail. Impose this habit on others. I haven't had an in-person meeting for my business in more than five years and have had fewer than a dozen conference calls, all lasting less than 30 minutes.

4. Speaking of 30 minutes, if you absolutely cannot stop a meeting or call from happening, *define the end time*. Do not leave these discussions open-ended, and keep them short. If things are well-defined, decisions should not take more than 30 minutes. Cite other commitments at odd times to make them more believable (e.g., 3:20 vs. 3:30) and force people to focus instead of socializing, commiserating, and digressing. If you must join a meeting that is scheduled to last a long time or that is open-ended, inform the organizer that you would like permission to cover your portion first, as you have a commitment in 15 minutes. If you have to, feign an urgent phone call. Get the hell out of there and have someone else update you later. The other option is to be completely transparent and voice your opinion of how unnecessary the meeting is. If you choose this route, be prepared to face fire and offer alternatives.

5. The cubicle is your temple—don't permit casual visitors. Some suggest using a clear "do not disturb" sign of some type, but I have found that this is ignored unless you have an office. My approach was to put headphones on, even if I wasn't listening to anything. If someone approached me despite this discouragement, I would pretend to be on the phone. I'd put a finger to my lips, say something like, "I hear you," and then say into the mic, "Can you hold on a second?" Next, I'd turn to the invader and say, "Hi. What can I do for you?" I wouldn't let them "get back to me" but rather force the person to give me a five-second summary and then send me an e-mail if necessary.

If headphone games aren't your thing, the reflexive response to an invader should be the same as when answering the cell phone: "Hi, invader. I'm right in the middle of something. How can I be of help?" If it's not clear within 30 seconds, ask the person to send you an e-mail about the chosen issue; do not offer to send them an e-mail first: "I'll be happy to help, but I have to finish this first. Can you send me a quick e-mail to remind me?" If you still cannot deflect an invader, give the person a time limit on your availability, which can also be used for phone conversations: "OK, I only have two minutes before a call, but what's the situation and what can I do to help?"

6. Use the Puppy Dog Close to help your superiors and others develop the no-meeting habit. The Puppy Dog Close in sales is so named because it is based on the pet store sales approach: If someone likes a puppy but is hesitant to make the life-altering purchase, just offer to let them take the pup home and bring it back if they change their minds. Of course, the return seldom happens.

The Puppy Dog Close is invaluable whenever you face resistance to permanent changes. Get your foot in the door with a "let's just try it once" reversible trial.

Compare the following:

> "I think you'd love this puppy. It will forever add to your responsibilities until he dies 10 years from now. No more care-free vacations, and you'll finally get to pick up poop all over the city—what do you think?"

vs.

Now imagine walking up to your boss in the hallway and clapping a hand on her shoulder:

> "I'd like to go to the meeting, but I have a better idea. Let's never have another one, since all we do is waste time and not decide anything useful."

vs.

The second set of alternatives seem less permanent, and they're intended to appear so. Repeat this

routine and ensure that you achieve more outside of the meeting than the attendees do within it; repeat the disappearing act as often as possible and cite improved productivity to convert this slowly into a permanent routine change.

Learn to imitate any good child: "Just this once! Please!!! I promise I'll do X!" Parents fall for it because kids help adults to fool themselves. It works with bosses, suppliers, customers, and the rest of the world, too.

Use it, but don't fall for it. If a boss asks for overtime "just this once," he or she will expect it in the future.

Time Consumers: Batch and Do Not Falter

A schedule defends from chaos and whim.

—ANNIE DILLARD, winner of Pulitzer Prize in nonfiction, 1975

If you have never used a commercial printer before, the pricing and lead times could surprise you.

Let's assume it costs $310 and takes one week to print 20 customized T-shirts with 4-color logos. How much and how long does it take to print 3 of the same T-shirt?

$310 and one week.

How is that possible? Simple—the setup charges don't change. It costs the printer the same amount in materials for plate preparation ($150) and the same in labor to man the press itself ($100). The setup is the real time-consumer, and thus the job, despite its small size, needs to be scheduled just like the other, resulting in the same one-week delivery date. The lower economy of scale picks up the rest: The cost for 3 shirts is $20 per shirt **x** 3 shirts instead of $3 per shirt **x** 20 shirts.

The cost- and time-effective solution, therefore, is to wait until you have a larger order, an approach called "batching." Batching is also the solution to our distracting but necessary **time consumers**, those repetitive tasks that interrupt the most important.

If you check mail and make bill payments five times a week, it might take 30 minutes per instance and you respond to a total of 20 letters in two and a half hours. If you do this once per week instead, it might take 60 minutes total and you still respond to a total of 20 letters. People do the former out of fear of emergencies. First, there are seldom real emergencies. Second, of the urgent communication you will receive, missing a deadline is usually reversible and otherwise costs a minimum to correct.

There is an inescapable setup time for all tasks, large or minuscule in scale. It is often the same for one as it is for a hundred. There is a psychological switching of gears that can require up to 45 minutes to resume a major task that has been interrupted. More than a quarter of each 9–5 period (28%) is consumed by such interruptions.[13]

This is true of all recurring tasks and is precisely why we have already decided to check e-mail and phone calls twice per day at *specific predetermined times* (between which we let them accumulate).

From mid-2004 to 2007, I checked mail no more than once a week, often not for up to four weeks at a time. Nothing was irreparable, and nothing cost more than $300 to fix. This batching has saved me hundreds of hours of redundant work. How much is your time worth?

Let's use a hypothetical example:

1. $20 per hour is how much you are paid or value your time. This would be the case, for example, if you

are paid $40,000 per year and get two weeks of vacation per year ($40,000 divided by [40 hours per week **x** 50 = 2,000] = $20/hour). Estimate your hourly income by cutting the last three zeroes off of your annual income and halving the remaining number (e.g., $50,000/year p $25/hour.

2. Estimate the amount of time you will save by grouping similar tasks together and batching them, and calculate how much you have earned by multiplying this hour number by your per-hour rate ($20 here):

1 × per week:	10 hours = $200
1 × per two weeks:	20 hours = $400
1 × per month:	40 hours = $800

3. Test each of the above batching frequencies and determine how much problems cost to fix in each period. If the cost is less than the above dollar amounts, batch even further apart.

For example, using our above math, if I check e-mail once per week and that results in an average loss of two sales per week, totaling $80 in lost profit, I will continue checking once per week because $200 (10 hours of time) minus $80 is still a $120 net gain, not to mention the enormous benefits of completing other main tasks in those 10 hours. If you calculate the financial and emotional benefit of completing just one main task (such as landing a major client or completing a life-changing trip), the value of batching is much more than the per-hour savings.

If the problems cost more than hours saved, scale back to the next-less-frequent batch schedule. In this case, I would drop from once per week to twice per week (not daily) and attempt to fix the system so that I can return to once per week. Do not work harder when the solution is working smarter. I have batched both personal and business tasks further and further apart as I've realized just how few real problems come up. Some of my scheduled batches in 2007 were e-mail (Mondays 10:00 A.M.), phone (completely eliminated), laundry (every other Sunday at 10:00 P.M.), credit cards and bills (most are on automatic payment, but I check balances every second Monday after e-mail), strength training (every 4th day for 30 minutes), etc.

Empowerment Failure: Rules and Readjustment

> The vision is really about empowering workers, giving them all the information about what's going on so they can do a lot more than they've done in the past.
>
> —BILL GATES, cofounder of Microsoft, richest man in the world

Empowerment failure refers to being unable to accomplish a task without first obtaining permission or information. It is often a case of being micromanaged or micromanaging someone else, both of which consume *your* time.

For the employee, the goal is to have full access to necessary information and as much independent decision-making ability as possible. For the entrepreneur, the goal is to grant as much information and independent decision-making ability to employees or contractors as possible.

Customer service is often the epitome of empowerment failure, and a personal example from BrainQUICKEN illustrates just how serious but easily solved the problem can be.

In 2002, I had outsourced customer service for order tracking and returns but still handled product-

related questions myself. The result? I received more than 200 e-mail per day, spending all hours between 9–5 responding to them, and the volume was growing at a rate of more than 10% per week! I had to cancel advertising and limit shipments, as additional customer service would have been the final nail in the coffin. It wasn't *a scalable* model. Remember this word, as it will be important later. It wasn't scalable because there was an information and decision bottleneck: me.

The clincher? The bulk of the e-mail that landed in my inbox was not product-related at all but requests from the outsourced customer service reps seeking permission for different actions:

The customer claims he didn't receive the shipment. What should we do?

The customer had a bottle held at customs. Can we reship to a U.S. address?

The customer needs the product for a competition in two days. Can we ship overnight, and if so, how much should we charge?

It was endless. Hundreds upon hundreds of different situations made it impractical to write a manual, and I didn't have the time or experience to do so regardless.

Fortunately, someone did have the experience: the outsourced reps themselves. I sent one single e-mail to all the supervisors that immediately turned 200 e-mail per day into fewer than 20 e-mail per week:

> Hi All,
>
> I would like to establish a new policy for my account that overrides all others.
>
> Keep the customer happy. If it is a problem that takes less than $100 to fix, use your judgment and fix it yourself.
>
> This is official written permission and a request to fix all problems that cost under $100 without contacting me. I am no longer your customer; my customers are your customer. Don't ask me for permission. Do what you think is right, and we'll make adjustments as we go along.
>
> Thank you,
>
> Tim

Upon close analysis, it became clear that more than 90% of the issues that prompted e-mail could be resolved for less than $20. I reviewed the financial results of their independent decision-making on a weekly basis for four weeks, then a monthly basis, and then on a quarterly basis.

It's amazing how someone's IQ seems to double as soon as you give them responsibility and indicate that you trust them. The first month cost perhaps $200 more than if I had been micromanaging. In the meantime, I saved more than 100 hours of my own time per month, customers received faster service, returns dropped to less than 3% (the industry average is 10–15%), and outsourcers spent less time on my account, all of which resulted in rapid growth, higher profit margins, and happier people on all sides.

People are smarter than you think. Give them a chance to prove themselves.

If you are a micromanaged employee, have a heart-to-heart with your boss and explain that you want to be more productive and interrupt him or her less. "I hate that I have to interrupt you so much and pull you away from more important things I know you have on your plate. I was doing some reading and had some thoughts on how I might be more productive. Do you have a second?"

Before this conversation, develop a number of "rules" like the previous example that would allow you to work more autonomously with less approval-seeking. The boss can review the outcome of your decisions on a daily or weekly basis in the initial stages. Suggest a one-week trial and end with "I'd like to try it. Does that sound like something we could try for a week?" or my personal favorite, "Is that

reasonable?" It's hard for people to label things unreasonable.

Realize that bosses are supervisors, not slave masters. Establish yourself as a consistent challenger of the status quo and most people will learn to avoid challenging you, particularly if it is in the interest of higher per-hour productivity.

If you are a micromanaging entrepreneur, realize that even if you can do something better than the rest of the world, it doesn't mean that's what you should be doing if it's part of the minutiae. Empower others to act without interrupting you.

SET THE RULES in your favor: Limit access to your time, force people to define their requests before spending time with them, and batch routine menial tasks to prevent postponement of more important projects. Do not let people interrupt you. Find your focus and you'll find your lifestyle.

The bottom line is that you only have the rights you fight for.

In the next section, **Automation**, we'll see how the New Rich create management-free money and eliminate the largest remaining obstacle of all: themselves.

► Q&A: QUESTIONS AND ACTIONS

> People think it must be fun to be a super genius, but they don't realize how hard it is to put up with all the idiots in the world.
>
> —CALVIN, from Calvin and Hobbes

Blaming idiots for interruptions is like blaming clowns for scaring children—they can't help it. It's their nature. Then again, I had (who am I kidding—and have), on occasion, been known to create interruptions out of thin air. If you're anything like me, that makes us both occasional idiots. Learn to recognize and fight the interruption impulse.

This is infinitely easier when you have a set of rules, responses, and routines to follow. It is your job to prevent yourself and others from letting the unnecessary and unimportant prevent the start-to-finish completion of the important.

This chapter differs from the previous in that the necessary actions, due to the inclusion of examples and templates, have been presented throughout from start to finish. This Q & A will thus be a summary rather than a repetition. The devil is in the details, so be sure to reread this chapter for the specifics.

The 50,000-foot review is as follows:

1. **Create systems to limit your availability via e-mail and phone and deflect inappropriate contact**. Get the autoresponse and voicemail script in place now, and master the various methods of evasion. Replace the habit of "How are you?" with "How can I help you?" Get specific and remember—no stories. Focus on immediate actions. Set and practice interruption-killing policies.

Avoid meetings whenever possible:

- ► Use e-mail instead of face-to-face meetings to solve problems.
- ► Beg-off going (this can be accomplished through the Puppy Dog

Close).

- If meetings are unavoidable, keep the following in mind:

- ► Go in with a clear set of objectives.

- ► Set an end time or leave early.

2. **Batch activities to limit setup cost and provide more time for dreamline milestones**.
What can I routinize by batching? That is, what tasks (whether laundry, groceries, mail, payments, or sales reporting, for example) can I allot to a specific time each day, week, month, quarter, or year so that I don't squander time repeating them more often than is absolutely necessary?

3. **Set or request autonomous rules and guidelines with occasional review of results**.
Eliminate the decision bottleneck for all things that are nonfatal if misperformed. If an employee, believe in yourself enough to ask for more independence on a trial basis. Have practical "rules" prepared and ask the boss for the sale after surprising him or her with an impromptu presentation. Remember the Puppy Dog Close—make it a one-time trial and reversible.

For the entrepreneur or manager, give others the chance to prove themselves. The likelihood of irreversible or expensive problems is minimal and the time savings are guaranteed. Remember, profit is only profitable to the extent that you can use it. For that you need time.

► TOOLS AND TRICKS

Eliminating Paper Distractions, Capturing Everything

► Evernote (www.evernote.com)

This is perhaps the most impressive tool I've found in the last year, introduced to me by some of the most productive technologists in the world. Evernote has eliminated more than 90% of the paper in my life and eliminated nearly all of the multiple tabs I used to leave open in web browsers, both of which distracted me to no end. It can clear out your entire office clutter in one to three hours.

Evernote allows you to easily capture information from anywhere using whatever device is at hand, and everything is then searchable (read: findable) from anywhere. I use it to:

- ► Take photographs of everything I might want to remember or find later—business cards, handwritten notes, wine labels, receipts, whiteboard sessions, and more. Evernote identifies the text in all of these pictures automatically, so it's all searchable(!), whether from an iPhone, your laptop, or the web. Just as one example, I can store and find the contact information from any business card in seconds (often using the built in iSight camera on Mac to

capture it), rather than spending hours inputting it all into contacts or searching through e-mail for that lost phone number. It's mind-numbing how much time this saves.

- ► Scan all agreements, paper articles, etc., that would otherwise sit in file folders or on my desk. I use the Mac Fujitsu ScanSnap miniscanner (http://bit.ly/scansnapmac), the best I've found, which scans all of it directly to Evernote in seconds with one button.

- ► Take snapshots of websites, capturing all text and links, so that I can read them offline when traveling or doing later research. Get rid of all those scattered bookmarks, favorites, and open tabs.

Screening and Avoiding Unwanted Calls

►**GrandCentral (www.grandcentral.com)** and **YouMail (www.youmail.com)**

In a world where your physical address will change more often than your cell phone number (and e-mail), it can be disastrous if your number becomes public or gets in the wrong hands. Enter GrandCentral, which will give you a number with the area code of your choosing that then forwards to your own phone(s). I now give a GrandCentral number to anyone besides family and close friends. Some of the benefits:

- ► Identify any incoming number as unwanted, and that caller will then hear a "number not in service" message when attempting to call you.

- ► Customize your voicemail message to individual callers (spouse, boss, colleague, client, etc.) and listen in on messages as they're being left, so you can "pick up" if the message is worth the interruption. Call recording is also an option.

- ► Use an area code outside of your hometown to prevent people and companies from finding and misusing addresses you'd prefer to

keep private.

- ► Establish do-not-disturb hours, when calls are routed directly to voicemail with no ring.

- ► Have voicemail sent to your cell phone as SMS (text messages).

YouMail, another option, can also transcribe voicemails and send them to your phone as text messages. Getting calls while stuck in a time-wasting meeting? No problem: Respond to voicemails via SMS during the meeting so you're not stuck returning calls afterward.

One Shot, One Kill Scheduling Without E-mail Back-and-Forth

Few things are as time-consuming as scheduling via e-mail. Person A: "How about Tues. at 3 P.M.?" Person B: "I can make it." Person C: "I have a meeting. How about Thurs.?" Person D: "I'm on a con-call. How about 10 A.M. on Fri.?" Use these tools to make scheduling simple and fast instead of another part-time job.

► **Doodle (www.doodle.com)**

The best free tool I've found for herding cats (multiple people) for scheduling without excessive e-mail. Create and poll in 30 seconds with the proposed options and forward a link to everyone invited. Check back a few hours later and you'll have the best time for the most people.

► **TimeDriver (www.timedriver.com)**

Let colleagues and clients self-schedule with you based on your availability, which is determined by integration with Outlook or Google Calendar. Embed a "schedule now" button in e-mail messages and you'll never have to tell people when you can make a call or meeting. Let them see what's open and choose.

Choosing the Best E-mail Batching Times

► **Xobni (www.xobni.com/special)**

Xobni—*inbox* spelled backwards—is a free program for putting Outlook on steroids. It offers many features, but the most relevant to this chapter is its ability to identify "hotspots," or periods of time when you receive the bulk of e-mail from your most important contacts. These "hotspots" are batching times that will enable you to keep critical contacts (clients, bosses, etc.) smiling even while you reduce checking e-mail to 1–3 times per day. It will also populate your contacts automatically by pulling phone numbers, addresses, etc., from separate e-mail buried in the inbox.

E-mailing Without Entering the Black Hole of the Inbox

Don't enter the black hole of the inbox off hours because you're afraid you'll forget something. Use these services instead to keep focused, whether on completing a critical project or simply enjoying the weekend.

► Jott (www.jott.com)

Capture thoughts, create to-do's, and set reminders with a simple toll-free phone call. The service transcribes your message (15–30 seconds) and e-mails it to whomever you want, including yourself, or to your Google calendar for automatic scheduling. Jott also enables you to post voice message links to Twitter (www.twitter.com), Facebook (www.facebook.com), and other services that tend to consume hours if you visit the sites themselves.

► Copy talk (www.copytalk.com)

Dictate any message up to four minutes and have the transcription e-mailed to you within hours. Excellent for brainstorming, and the accuracy is astounding.

Preventing Web Browsing Completely

► Freedom (http://www.ibiblio.org/fred/freedom/)

Freedom is a free application that disables networking on an Apple computer for 1–480 mintues (up to eight hours) at a time. Freedom will free you from the distractions of the Internet, allowing you the focus to get real work done.

Freedom enforces freedom; a reboot is the only method for turning Freedom off before the time limit you've set for yourself. The hassle of rebooting means you're less likely to cheat, and you'll be more productive. Experiment with the software for short periods of time at first (30–60 minutes.)

► COMFORT CHALLENGE

Revisit the Terrible Twos (2 Days)

For the next two days, do as all good two-year-olds do and say "no" to all requests. Don't be selective. Refuse to do all things that won't get you immediately fired. Be selfish. As with the last exercise, the objective isn't an outcome—in this case, eliminating just those things that waste time—but the process: getting comfortable with saying "no." Potential questions to decline include the following:

Do you have a minute?

Want to see a movie tonight/tomorrow?

Can you help me with X?

"No" should be your default answer to all requests. Don't make up elaborate lies or you'll get called on them. A simple "I really can't—sorry; I've got too much on my plate right now" will do as a catch-all response.

► LIFESTYLE DESIGN IN ACTION

Batching tool—PO Box: This might be stating the obvious, but one easy way to encourage batching of your mail is to use a PO Box versus getting mail delivered to your house. We got our PO Box to limit access to our physical address online, but it also encourages you to get the mail less and deal with it in batch. Our post office has recycling bins, so at least 60% of the mail doesn't even come home with us. For a while I was only getting and managing the mail once a week, and I found not only did it take less time overall, I did a better job managing it and getting it out of the way versus looking at it and setting it aside for future follow up.

—LAURA TURNER

• • •

For families, the four-hour workweek doesn't have to mean four months on a sailboat in the Caribbean unless that's their dream, but even the simple ideal of having time to take a walk in the park every evening or spending weekends together, makes taking actions to implement this program worthwhile.

[There are many different approaches for making this work]: Kids have to promise they won't bother Mommy in the evening while she works on the computer, the husband watches the kids in the evening, both parents make plans once a week to have someone take care of the kids, etc. Then close with the huge payoff for the family of having more time to spend with each other.

—ADRIENNE JENKINS

• • •

Why not combine a mini-retirement with dentistry (or medical) geoarbitrage and finance your trip with the savings? I lived in Thailand for four months and got root canal treatment and a crown for 1/3 of the price that it costs in Australia. There are many upmarket clinics set up for "expats" and health travelers in Thailand, Philippines, Vietnam, Goa, etc., with English-speaking dentists. And in Europe many people go to Poland or Hungary. To research, just Google "dentist" and the country and you will come across practices advertising to foreigners. Talk to expats when you're in the country or on online chat forums for recommendations. Now I'm in Australia I still combine my travels with annual dentist checkups—and the savings often finance my airfare. Even between developed countries there are significant cost differences. For example France is far cheaper than the UK and Australia is cheaper than the U.S. [Note from Tim: Learn more about the incredible world of medical tourism and geoarbitrage at http://en.wikipedia.org/wiki/Medical_tourism. Even large insurers like AETNA often cover overseas treatments and surgeries.]

—ANONYMOUS

12. This habit alone can change your life. It seems small but has an enormous effect.

13. Jonathan B. Spira and Joshua B. Feintuch, *The Cost of Not Paying Attention: How Interruptions*

Impact Knowledge Worker Productivity (Basex, 2005).

Step III:
A is for Automation

SCOTTY: She's all yours, sir. All systems automated and ready. A chimpanzee and two trainees could run her!
CAPTAIN KIRK: Thank you, Mr. Scott. I'll try not to take that personally .

— STAR TREK

8
Outsourcing Life

► OFF-LOADING THE REST AND A TASTE OF GEOARBITRAGE [14]

A man is rich in proportion to the number of things he can afford to let alone.

—HENRY DAVID THOREAU, naturalist

If I told you this story, you wouldn't believe me, so I'll let AJ tell it. It will set the stage for even more incredible things to come, all of which you will do yourself.

My Outsourced Life

A true account by AJ Jacobs, editor-at-large at *Esquire* magazine (ellipses represent passage of time between entries)

IT BEGAN a month ago. I was midway through *The World Is Flat*, the bestseller by Tom Friedman. I like Friedman, despite his puzzling decision to wear a mustache. His book is all about how outsourcing to India and China is not just for tech support and carmakers but is poised to transform every industry in America, from law to banking to accounting.

I don't have a corporation; I don't even have an up-to-date business card. I'm a writer and editor working from home, usually in my boxer shorts or, if I'm feeling formal, my penguin-themed pajama bottoms. Then again, I think, why should Fortune 500 firms have all the fun? Why can't I join in on the biggest business trend of the new century? Why can't I outsource my low-end tasks? Why can't I outsource my life?

The next day I e-mail Brickwork, one of the companies Friedman mentions in his book. Brickwork—based in Bangalore, India—offers "remote executive assistants," mostly to financial firms and healthcare companies that want data processed. I explain that I'd like to hire someone to help with *Esquire-related* tasks—doing research, formatting memos, like that. The company's CEO, Vivek Kulkarni, responds, "It would be a great pleasure to be talking to a person of your stature." Already I'm liking this. I've never had stature before. In America, I barely command respect from a Bennigan's maître d', so it's nice to know that in India I have stature.

A couple of days later, I get an e-mail from my new "remote executive assistant."

> Dear Jacobs,
>
> My name is Honey K. Balani. I would be assisting you in your editorial and personal job.... I would try to adapt myself as per your requirements that would lead to desired satisfaction.

Desired satisfaction. This is great. Back when I worked at an office, I had assistants, but there was never any talk of *desired satisfaction*. In fact, if anyone ever used the phrase "desired satisfaction," we'd all end up in a solemn meeting with HR.

• • •

I GO OUT to dinner with my friend Misha, who grew up in India, founded a software firm, and subsequently became nauseatingly rich. I tell him about Operation Outsource. "You should call Your Man in India," he says. Misha explains that this is a company for Indian businessmen who have moved overseas but who still have parents back in New Delhi or Mumbai. YMII is their overseas concierge service—it buys movie tickets and cell phones and other sundries for abandoned moms.

Perfect. This could kick my outsourcing up to a new level. I can have a nice, clean division of labor: Honey will take care of my business affairs, and YMII can attend to my personal life—pay my bills, make vacation reservations, buy stuff online. Happily, YMII likes the idea, and just like that the support team at Jacobs Inc. has doubled.

• • •

HONEY HAS completed her first project for me: research on the person *Esquire* has chosen as the Sexiest Woman Alive. I've been assigned to write a profile of this woman, and I really don't want to have to slog through all the heavy-breathing fan websites about her. When I open Honey's file, I have this reaction: America is f*cked. There are charts. There are section headers. There is a well-organized

breakdown of her pets, measurements, and favorite foods (e.g., swordfish). If all Bangalorians are like Honey, I pity Americans about to graduate college. They're up against a hungry, polite, Excel-proficient Indian army.

• • •

IN FACT, in the next few days, I outsource a whole mess of online errands to Asha (from the personal service YMII): paying my bills, getting stuff from drugstore.com, finding my son a Tickle Me Elmo. (Actually, the store was out of Tickle Me Elmos, so Asha bought a Chicken Dance Elmo—good decision.) I had her call Cingular to ask about my cell-phone plan. I'm just guessing, but I bet her call was routed from Bangalore to New Jersey and then back to a Cingular employee in Bangalore, which makes me happy for some reason.

• • •

IT'S THE fourth morning of my new, farmed-out life, and when I flip on my computer, my e-mail inbox is already filled with updates from my overseas aides. It's a strange feeling having people work for you while you sleep. Strange, but great. I'm not wasting time while I drool on my pillow; things are getting done.

• • •

HONEY IS my protector. Consider this: For some reason, the Colorado Tourism Board e-mails me all the time. (Most recently, they informed me about a festival in Colorado Springs featuring the world's most famous harlequin.) I request that Honey gently ask them to stop with the press releases. Here's what she sent:

> Dear All,
>
> Jacobs often receives mails from Colorado news, too often. They are definitely interesting topics. However, these topics are not suitable for "Esquire."
>
> Further, we do understand that you have taken a lot of initiatives working on these articles and sending it to us. We understand. Unfortunately, these articles and mails are too time consuming to be read.
>
> Currently, these mails are not serving right purpose for both of us. Thus, we request to stop sending these mails.
>
> We do not mean to demean your research work by this.
>
> We hope you understand too.
>
> Thanking you,
>
> Honey K B

That is the best rejection notice in journalism history. It's exceedingly polite, but there's a little undercurrent of indignation. Honey seems almost outraged that Colorado would waste the valuable time of Jacobs.

• • •

I DECIDE to test the next logical relationship: my marriage. These arguments with my wife are killing me—partly because Julie is a much better debater than I am. Maybe Asha can do better:

Hello Asha,

My wife got annoyed at me because I forgot to get cash at the automatic bank machine … I wonder if you could tell her that I love her, but gently remind her that she too forgets things—she has lost her wallet twice in the last month. And she forgot to buy nail clippers for Jasper.

AJ

I can't tell you what a thrill I got from sending that note. It's pretty hard to get much more passive-aggressive than bickering with your wife via an e-mail from a subcontinent halfway around the world.

The next morning, Asha CC'd me on the e-mail she sent to Julie.

Julie,

Do understand your anger that I forgot to pick up the cash at the automatic machine. I have been forgetful and I am sorry about that.

But I guess that doesn't change the fact that I love you so much….

Love
AJ

P. S. This is Asha mailing on behalf of Mr. Jacobs.

As if that weren't enough, she also sent Julie an e-card. I click on it: two teddy bears embracing, with the words, "Anytime you need a hug, I've got one for you…. I'm sorry."

Damn! My outsourcers are too friggin' nice! They kept the apology part but took out my little jabs. They are trying to save me from myself. They are superegoing my id. I feel castrated.

Julie, on the other hand, seems quite pleased: "That's nice, sweetie. I forgive you."

• • •

DESPITE THREE weeks with my support team, I'm still stressed. Perhaps it's the fault of Chicken Dance Elmo, whom my son loves to the point of dry humping, but who is driving me slowly insane. Whatever the reason, I figure it's time to conquer another frontier: outsourcing my inner life.

First, I try to delegate my therapy. My plan is to give Asha a list of my neuroses and a childhood anecdote or two, have her talk to my shrink for 50 minutes, then relay the advice. Smart, right? My shrink refused. Ethics or something. Fine. Instead, I have Asha send me a meticulously researched memo on stress relief. It had a nice Indian flavor to it, with a couple of yogic postures and some visualization.

This was okay, but it didn't seem quite enough. I decided I needed to outsource my worry. For the last few weeks I've been tearing my hair out because a business deal is taking far too long to close. I asked Honey if she would be interested in tearing her hair out in my stead. Just for a few minutes a day. She thought it was a wonderful idea. "I will worry about this every day," she wrote. "Do not worry."

The outsourcing of my neuroses was one of the most successful experiments of the month. Every time I started to ruminate, I'd remind myself that Honey was already on the case, and I'd relax. No joke—this alone was worth it.

At a Glance: Where You Will Be

The future is here. It's just not widely distributed yet.

—WILLIAM GIBSON, author of *Neuromancer;* coined term "cyberspace" in 1984

Here is a sneak preview of full automation.

I woke up this morning, and given that it's Monday, I checked my e-mail for one hour after an exquisite Buenos Aires breakfast.

Sowmya from India had found a long-lost high school classmate of mine, and Anakool from YMII had put together Excel research reports for retiree happiness and the average annual hours worked in different fields. Interviews for this week had been set by a third Indian virtual assistant, who had also found contact information for the best Kendo schools in Japan and the top salsa teachers in Cuba. In the next e-mail folder, I was pleased to see that my fulfillment account manager in Tennessee, Beth, had resolved nearly two dozen problems in the last week—keeping our largest clients in China and South Africa smiling—and had also coordinated California sales tax filing with my accountants in Michigan. The taxes had been paid via my credit card on file, and a quick glance at my bank accounts confirmed that Shane and the rest of the team at my credit card processor were depositing more cash than last month. All was right in the world of automation.

It was a beautiful sunny day, and I closed my laptop with a smile. For an all-you-can-eat buffet breakfast with coffee and orange juice, I paid $4 U.S. The Indian outsourcers cost between $4–10 U.S. per hour. My domestic outsourcers are paid on performance or when product ships. This creates a curious business phenomenon: Negative cash flow is impossible.

Fun things happen when you earn dollars, live on pesos, and compensate in rupees, but that's just the beginning.

But I'm an Employee! How Does This Help Me?

Nobody can give you freedom. Nobody can give you equality or justice or anything. If you're a man, you take it.

—MALCOLM X, *Malcolm X Speaks*

Getting a remote personal assistant is a huge departure point and marks the moment that you learn how to give orders and be commander instead of the commanded. It is small-scale training wheels for the most critical of **NR** skills: remote management and communication.

It is time to learn how to be the boss. It isn't time-consuming. It's low-cost and it's low-risk. Whether or not you "need" someone at this point is immaterial. It is an exercise.

It is also a litmus test for entrepreneurship: Can you manage (direct and chastise) other people? Given the proper instruction and practice, I believe so. Most entrepreneurs fail because they jump into the deep end of the pool without learning to swim first. Using a virtual assistant (VA) as a simple exercise with no downside, the basics of management are covered in a 2–4-week test costing between $100–400. This is an investment, not an expense, and the ROI is astounding. It will be repaid in a maximum of 10–14 days, after which it is pure timesaving profit.

Becoming a member of the **NR** is not just about working smarter. It's about building a system to replace yourself.

This is the first exercise.

Even if you have no intention of becoming an entrepreneur, this is the ultimate continuation of our 80/20 and elimination process: Preparing someone to replace you (even if it never happens) will produce an ultrarefined set of rules that will cut remaining fat and redundancy from your schedule. Lingering unimportant tasks will disappear as soon as someone else is being paid to do them.

But what about the cost?

This is a hurdle that is hard for most. If I can do it better than an assistant, why should I pay them at all? *Because the goal is to free your time to focus on bigger and better things*.

This chapter is a low-cost exercise to get you past this lifestyle limiter. It is absolutely necessary that you realize that you can always do something more cheaply yourself. This doesn't mean you want to spend your time doing it. If you spend your time, worth $20–25 per hour, doing something that someone else will do for $10 per hour, it's simply a poor use of resources. It is important to take baby steps toward paying others to do work for you. Few do it, which is another reason so few people have their ideal lifestyles.

Even if the cost is occasionally more per hour than you currently earn, the trade is often worth it. Let's assume you make $50,000 and thus $25 per hour (working from 9–5, Monday through Friday, for 50 weeks per year). If you pay a top-notch assistant $30 per hour and he or she saves you one full 8-hour shift per week, your cost (subtracting what you're being paid) is $40 to free an extra day. Would you pay $40 per week to work Monday to Thursday? I would, and I do. Keep in mind that this is a worst-case cost scenario.

But what if your boss freaks out?

It's largely a non-issue, and prevention is better than cure. There is no ethical or legal reason for the boss to know if you choose non-sensitive tasks. The first option is to assign personal items. Time is time, and if you're spending time on chores and errands that could be spent better elsewhere, a VA will improve life and the management learning curve is similar. Second, you can delegate business tasks that don't include financial information or identify your company.

Ready to build an army of assistants? Let's first look at the dark side of delegation. A review is in order to prevent abuses of power and wasteful behavior.

Delegation Dangers: Before Getting Started

> The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.
>
> —BILL GATES

Have you ever been given illogical assignments, handed unimportant work, or commanded to do something in the most inefficient fashion possible? Not fun and not productive.

Now it's your turn to show that you know better. Delegation is to be used as a further step in reduction, not as an excuse to create more movement and add the unimportant. Remember—unless something is well-defined and important, no one should do it.

Eliminate before you delegate.

Never automate something that can be eliminated, and never delegate something that can be automated or streamlined. Otherwise, you waste someone else's time instead of your own, which now wastes your hard-earned cash. How's that for incentive to be effective and efficient? Now you're playing with your own dough. It's something I want you to get comfortable with, and this baby step is small stakes.

Did I mention to eliminate before you delegate?

For example, it is popular among executives to have assistants read e-mail. In some cases this is valuable. In my case, I use spam filters, autoresponders with FAQs, and automatic forwarding to outsourcers to limit my e-mail obligation to 10–20 e-mail responses per week. It takes me 30 minutes per week because I used systems—elimination and automation—to make it so.

Nor do I use an assistant to set meetings and conference calls because I have eliminated meetings. If I need to set the odd 20-minute call for a given month, I'll send one two-sentence e-mail and be done with it.

Principle number one is to refine rules and processes before adding people. Using people to leverage a refined process multiplies production; using people as a solution to a poor process multiplies problems.

The Menu: A World of Possibilities

> I am not interested in picking up crumbs of compassion thrown from the table of someone who considers himself my master. I want the full menu of rights.
>
> —BISHOP DESMOND TUTU, South African cleric and activist

The next question then becomes, "What should you delegate?" It's a good question, but I don't want to answer it. I want to watch *Family Guy*.

The truth be told, it is a hell of a lot of work writing about not working. Ritika of Brickwork and Venky of YMII are more than capable of writing this section, so I'll just mention two guidelines and leave the mental hernia of detail work to them.

> **Golden Rule #1:** Each delegated task must be both time-consuming *and well-defined*. If you're running around like a chicken with its head cut off and assign your VA to do that for you, it doesn't improve the order of the universe.
>
> **Golden Rule #2:** On a lighter note, have some fun with it. Have someone in Bangalore or Shanghai send e-mails to friends as your personal concierge to set lunch dates or similar basics. Harass your boss with odd phone calls in strong accents from unknown numbers. Being effective doesn't mean being serious all the time. It's fun being in control for a change. Get a bit of repression off your chest so it doesn't turn into a complex later.

Getting Personal and Going Howard Hughes

Howard Hughes, the ultrarich filmmaker and eccentric from *The Aviator*, was notorious for assigning odd tasks to his assistants. Here are a few from Donald Bartlett's *Howard Hughes: His Life and Madness you* might want to consider.

1. After his first plane crash, Hughes confided in a friend that he believed his recovery was due to his

consumption of orange juice and its healing properties. He believed that exposure to the air diluted the juice's potency, so he demanded that fresh oranges be sliced and juiced in front of him.

2. When Hughes was partaking of the nightlife in Las Vegas, his aides were charged with approaching any girls he took a liking to. If a girl was invited to join the Hughes table and agreed, an aide would pull out a waiver and agreement for her to sign.

3. Hughes had a barber on call 24/7 but had his hair and nails trimmed about once a year.

4. In his hotel-bound years, Hughes was rumored to have instructed assistants to place a single cheeseburger in a specific tree outside his penthouse room at a 4:00 P.M. each day, whether he was there or not.

Such a world of possibilities! Just as the Model-T brought transportation to the masses, virtual assistants bring eccentric billionaire behavior within reach of each man, woman, and child. Now, that's progress.

Without further ado, let me pass the mic. Note that YMII performs both personal and business tasks, whereas Brickwork focuses solely on business projects. Let's start with the important but dull stuff and move quickly from the sublime to the ridiculous. To give a true taste of what to expect, I have not corrected non-native-sounding English.

Venky: Don't limit yourself. Just ask us if something is possible. We've arranged parties, organized caterers, researched summer courses, cleaned up accounting books, created 3D drafts based on blueprints. Just ask us. We could find the closest kid-friendly restaurant to your house for your son's birthday, finding out costs and organizing the birthday party. This frees up your time to work or hang out with your son.

What can we not do? We can't do anything that would require our physical presence. But you would be surprised as to how small a set of tasks that is in this day and age.

Here are the most common tasks we handle:

► scheduling interviews and meetings ► web-research ► following up on appointments, errands, and tasks ► online purchases ► creation of legal documents ► website maintenance (web design, publishing, uploading files) that doesn't require a professional designer ► monitoring, editing, and publishing comments for online discussions ► posting job vacancies on the web ► document creation ► proofreading and editing documents for spelling and formatting ► online research for updating blogs ► updating the database for Customer Relationship Management Software ► managing recruitment processes ► updating invoices and receiving payments ► voicemail transcription

Ritika at Brickwork added the following:

► market research ► financial research ► business plans ► industry analysis ► market assessment reports ► preparing presentations ► reports and newsletters ► legal research ► analytics ► website development ► search engine optimization ► maintaining and updating databases ► credit scoring ► managing procurement processes

Venky: We have a forgetful client who has us call him all the time with various reminders. One of our clients on a custom plan has us wake him up every morning. We've done the legwork and found people who fell out of contact after Katrina. Found jobs for clients! My favorite so far: One of our clients has a pair of trousers that he really likes that aren't in production anymore. He's sending them to Bangalore (from London) to have created exact replicas at a tiny fraction of the price.

Here are a few other YMII custom requests:

- ► Reminding an overzealous client to pay his current parking fines, as well as not speed and collect parking fines.
- ► Apologizing and sending flowers and cards to spouses of clients.
- ► Charting a diet plan, reminding client on it regularly, ordering groceries based on the specific diet plan.
- ► Getting a job for a person who lost his job due to outsourcing a year back. We did the job search, did the cover letters, did the resume tuning, and got the client a job in 30 days.
- ► Fixing a broken windowpane of a house in Geneva, Switzerland.
- ► Collecting homework information from teacher's voicemail and e-mailing it to the client (parents of the kid).
- ► Research on how to tie a shoelace meant for a kid (client's son).

- ► Find a parking slot for your car in some other city even before you make the trip.
- ► Ordered garbage bins for home.
- ► Get an authenticated weather forecast and weather report for a particular time in a particular place on a particular day, five years ago. This was to be used as supportive evidence for a lawsuit.
- ► Talking to parents in our client's stead.

Here's another real example of personal outsourcing from reader David Cross, who got a personal chef at home for less than $5 per meal. Just thinking of the possibilities is enough to make you start drooling. He explains:

I wanted to find someone to prepare food I love. I trained as a chef but I am often so busy and as I am the only one in the house who really cooks, I often don't have time to prepare the food that makes me feel the healthiest so I wrote the attached ad and dropped it on Craigslist.

This was a very tight focus—ultraspecific—I had just two applicants in two months—one who was a 2/10 match but the guy we just OK'd was a Hare Krishna follower for many years, lived in India, and his sample menu proved he knew what he's doing so we just started him.

The food is absolutely awesome. The hourly rate is *extremely reasonable,* he's a five-minute detour when either of us are in town to collect food and I now have delicious Indian food for less than $5 a meal and it's as good as anything I've ever eaten anywhere.

I'm going to progress to other cuisines now… Thai, Italian, Chinese, etc., and it means when I do have time to cook I'll enjoy doing it that much more as I am not the only one cooking!

Indian/Asian Vegetarian Cook Needed

Date: 2007–06–07, 12:25PM PDT

Hello.

We are a local, international family who love Indian and Asian vegetarian food. We are looking for a cook experienced in this wonderful cuisine to prepare delicious, fresh, healthy, authentic Indian/Asian vegetarian meals for us.

If you've cooked a curry once or twice or need to follow recipes, this position is probably not for you,

but if you know Indian vegetarian cooking in depth and can prepare delicious, healthy, fresh, authentic Indian vegetarian food then we'd like to hear from you. This could be an ideal opportunity if you are Indian, Pakistani, Punjabi, etc., and are looking for a great way to apply your experience and love of Indian vegetarian food, cooking and culture. Knowledge of Ayurved and how this relates to food and diet is a plus though not essential.

Please reply with details of your experience and some dishes you could prepare. If we like what you have to offer, we'll arrange for you to cook a sample meal or two which we will pay you for and then we'll see what works out for us all.

This is a part-time position. You will be self-employed and responsible for your own taxes, etc. We'll pay you an hourly rate we will agree with you plus grocery bills for the food you prepare. You can prepare food in your own place and we can arrange to collect it from you, possibly for us to freeze for later eating. We will work with you to come up with menus and schedules that work out for you and us.

Thank you for your interest.

Basic Choices: New Delhi or New York?

There are tens of thousands of VAs—how on earth do you find the right one? The resources at the end of this chapter will show you where to look, but it is overwhelming and confusing unless you have a few criteria determined in advance.

It often helps to begin with the question "Where on Earth?"

Remote or Local?

"Made in the USA" doesn't have the ring it used to. The pros of jumping time zones and visiting third-world currency are twofold: People work while you sleep, and the per-hour expense is less. Time savings and cost savings. Ritika explains the former with an example.

One can give the remote personal assistant in India their assignment when they are leaving work at the end of the day in New York City, and they will have the presentation ready the next morning. Because of the time difference with India, assistants can work on it while they are asleep and have it back in their morning. When they wake up, they will find the completed summary in their inbox. These assistants can also help them keep pace with what they want to read, for example.

Indian and Chinese VAs, as well as most from other developing countries, will run $4–15 per hour, the lower end being limited to simple tasks and the higher end including the equivalent of Harvard or Stanford M.B.A.s and Ph.D.s. Need a business plan to raise funding? Brickwork can provide it for between $2,500–5,000 instead of $15,000–20,000. Foreign assistance isn't just for the small time. I know from firsthand discussions that executives from big five accounting and management consulting firms routinely charge clients six figures for research reports that are then farmed to India for low four figures.

In the U.S. or Canada, the per-hour range is often $25–100. Seems like an obvious choice, right? Bangalore 100%? It's not. The important metric is cost per completed task, not cost per hour.

The biggest challenge with overseas help will be the language barrier, which often quadruples back-and-forth discussion and the ultimate cost. The first time I hired an Indian VA, I made the fundamental mistake of not setting an hour cap for three simple tasks. I checked in later that week and found he had spent 23 hours chasing his tail. He had scheduled one tentative interview for the following week, set at the wrong time! Mind boggling. 23 hours? It ended up costing me, at $10 per hour, $230. The same tasks, assigned later that week to a native English speaker in Canada, were completed in two hours at $25 per hour. $50 for more than four times the results. That said, I later requested another Indian VA from the same firm who was able to duplicate the native speaker results.

How do you know which to choose? That's the beautiful part: You don't. It's a matter of testing a few assistants to both sharpen your communication skills and determine who is worth hiring and who is worth firing. Being a results-based boss isn't as simple as it looks.

There are a number of lessons to be learned here.

First, per-hour cost is not the ultimate determinant of cost. Look at per-task cost. If you need to spend time restating the task and otherwise managing the VA, determine the time required of you and add this (using your per-hour rate from earlier chapters) to the end sticker price of the task. It can be surprising. As cool as it is to say that you have people working for you in three countries, it's uncool to spend time babysitting people who are supposed to make your life easier.

Second, the proof is in the pudding. It is impossible to predict how well you will work with a given VA without a trial. Luckily, there are things you can do to improve your odds, and one of them is using a VA firm instead of a solo operator.

Solo vs. Support Team

Let's suppose you find the perfect VA. He or she is performing all of your noncritical tasks and you've decided to take a much-deserved vacation to Thailand. It's nice to know someone besides you will be manning the wheel and putting out fires for a change. Finally, some relief! Two hours before your flight from Bangkok to Phuket, you receive an e-mail: Your VA is out of commission and will be in the hospital for the next week. Not good. Vacation FUBAR.

I don't like being dependent on one person, and I don't recommend it in the least. In the world of high technology, this type of dependency would be referred to as a "single point of failure"—one fragile item upon which all else depends. In the world of IT,[15] the term "redundancy" is used as a selling point for systems that continue to function if there is a malfunction or mechanical failure in any given part. In the context of VAs, redundancy entails having fallback support.

I recommend that you hire a VA firm or VAs with backup teams instead of sole operators. Examples abound, of course, of people who have had a single assistant for decades without incident, but I suggest that this is the exception rather than the rule. Better safe than sorry. Besides simple disaster avoidance, a group structure provides a pool of talent that allows you to assign multiple tasks without bothering to find a new person with the qualifications. Brickwork and YMII both exemplify this type of structure and provide a single point of contact, a personal account manager, who then farms out your tasks to the most-capable people in the group and across different shifts. Need graphic design? Covered. Need database management? Covered. I don't like calling and coordinating multiple people. I want one-stop shopping and am willing to pay 10% more to have it. I encourage you to be similarly pound-wise and penny-foolish.

Team preference doesn't mean that bigger is better, just that multiple people are better than one person. The best VA I have used to date is an Indian with five backup assistants under him. Three can be more than sufficient, but two is toeing the line.

The #1 Fear: "Sweetheart, Did You Buy a Porsche in China?"

I'm sure you might have your fears. AJ certainly did:

My outsourcers now know an alarming amount about me—not just my schedule but my cholesterol, my infertility problems, my Social Security number, my passwords (including the one that is a particularly adolescent curse word). Sometimes I worry that I can't piss off my outsourcers or I'll end up with a $12,000 charge on my MasterCard bill from the Louis Vuitton in Anantapur.

The good news is that misuse of financial and confidential information is rare. In all of the interviews I conducted for this section, I could find only one case of information abuse, and I had to search long and hard. It involved an overworked U.S.-based VA who hired freelance help at the last moment.

Commit to memory the following—never use the new hire. Prohibit small-operation VAs from subcontracting work to untested freelancers without your written permission. The more established and higher-end firms, Brickwork in the below example, have security measures that border on excessive and make it simple to pinpoint abusers in the case of a breach:

- ► Employees undergo background checks and sign NDAs (nondisclosure agreements) in accordance with the company policy of maintaining confidentiality of client information
- ► Electronic access card for entry and exit
- ► Credit card information keyed only by select supervisors
- ► Removal of paper from the offices is prohibited
- ► VLAN-based access restrictions between different teams; this ensures that there is no unauthorized access of information between people of different teams in the organization
- ► Regular reporting on printer logs

- ► Floppy drives and USB ports disabled
- ► BS779 certification for accomplished international security standards
- ► 128-bit encryption technology for all data exchange
- ► Secure VPN connection

I bet there is a fair chance that sensitive data is 100 times safer with Brickwork than on your own computer.

Still, information theft is best thought of as inevitable in a digital world, and precautions should be taken with damage control in mind. There are two rules that I use to minimize damage and allow for fast repair.

1. Never use debit cards for online transactions or with remote assistants. Reversing unauthorized credit card charges, particularly with American Express, is painless and near instantaneous. Recovering funds withdrawn from your checking account via unauthorized debit card use takes dozens of hours in paperwork alone and can take months to receive, if approved at all.
2. If your VA will be accessing websites on your behalf, create a new unique login and password to be used on those sites. Most of us reuse both logins and passwords on multiple sites, and taking this precaution limits possible damage. Instruct them to use these unique logins to create accounts on new sites if needed. Note that this is particularly important when using assistants who have access to live commercial websites (developers, programmers, etc.).

If information or identity theft hasn't hit you, it will. Use these guidelines and you'll realize when it happens that, just like most nightmares, it's not that big a deal and is reversible.

The Complicated Art of Simplicity: Common Complaints

My assistant is an idiot! It took him 23 hours to book an interview! This was the first complaint I had, for sure. 23 hours! I was heated up for a shouting match. My original e-mail to this first assistant seemed clear enough.

Dear Abdul,

Here are the first tasks, due at the end of next Tuesday. Please call or e-mail with any questions:

1. Go to this article http://www.msnbc.msn.com/id/12666060/site/newsweek/, get the phone/e-mail/website contacts for Carol Milligan and Marc and Julie Szekely. Also find the same info for Rob Long here http://www.msnbc.msn.com/id/12652789/site/newsweek/.

2. Schedule 30-minute interviews for Carol, Marc/Julie, and Rob. Use www.myevents.com (username: notreal, password: donttryit) to book them in my calendar for next week any time between 9–9 ET.

3. Find the name, e-mail, and phone (phone is least important) of workers in the U.S. who have negotiated remote work agreements (telecommuting) despite resistant bosses. Those who have traveled outside the U.S. are ideal. Other keywords could include "teleworking" and "telecommuting." The important factor is that they negotiated with difficult bosses. Please send me links to their profiles or write a paragraph describing why they fit the profile above.

Look forward to seeing what you can do. Please e-mail if you don't understand or have questions.

Best,
Tim

The truth is—I was at fault. This is not a good debut demand, and I made fatal mistakes even before composing it. If you are an effective person but unaccustomed to issuing commands, assume that most problems at the outset are your fault. It is tempting to immediately point the finger at someone else and huff and puff, but most beginner bosses repeat the same mistakes I made.

1. I accepted the first person the firm provided and made no special requests at the outset.

Request someone who has "excellent" English and indicate that phone calls will be required (even if not). Be fast to request a replacement if there are repeated communication issues.

2. I gave imprecise directions.

I asked him to schedule interviews but didn't indicate that it was for an article. He assumed, based on work with previous clients, that I wanted to hire someone and he misspent time compiling spreadsheets and combing online job sites for additional information I didn't need.

Sentences should have one possible interpretation and be suitable for a 2nd-grade reading level. This goes for native speakers as well and will make requests clearer. Ten-dollar words disguise imprecision.

Note that I asked him to respond *if* he didn't understand or had questions. This is the wrong approach. Ask foreign VAs to rephrase tasks to confirm understanding before getting started.

3. I gave him a license to waste time.

This brings us again to damage control. Request a status update after a few hours of work on a task to ensure that the task is both understood and achievable. Some tasks are, after initial attempts, impossible.

4. I set the deadline a week in advance.

Use Parkinson's Law and assign tasks that are to be completed within no more than 72 hours. I have had the best luck with 48 and 24 hours. This is another compelling reason to use a small group (three or more) rather than a single individual who can become overtaxed with last-minute requests from multiple clients. Using short deadlines does not mean avoiding larger tasks (e.g., business plan), but rather breaking them into smaller milestones that can be completed in shorter time frames (outline, competitive research summaries, chapters, etc.).

5. I gave him too many tasks and didn't set an order of importance.

I advise sending one task at a time whenever possible and no more than two. If you want to cause your computer to hang or crash, open 20 windows and applications at the same time. If you want to do the

same to your assistant, assign him or her a dozen tasks without prioritizing them. Recall our mantra: Eliminate before you delegate.

WHAT DOES A good VA task e-mail look like? The following example was recently sent to an Indian VA whose results have been nothing short of spectacular:

> Dear Sowmya,
>
> Thank you. I would like to start with the following task.
>
> TASK: I need to find the names and e-mails of editors of men's magazines in the US (for example: maxim, stuff, GQ, esquire, blender, etc.) who also have written books. An example of such a person would be AJ Jacobs who is Editor-at-Large of Esquire (www.ajjacobs.com). I already have his information and need more like him.
>
> Can you do this? If not, please advise. **Please reply and confirm what you will plan to do to complete this task**.
>
> DEADLINE: Since I'm in a rush, get started after your next e-mail and stop at 3 hours and tell me what results you have. Please begin this task now if possible. The deadline for these 3 hours and reported results is end-of-day ET Monday.
>
> Thank you for your fastest reply,
>
> Tim

Short, sweet, and to the point. Clear writing, and therefore clear commands, come from clear thinking. Think simple.

• • •

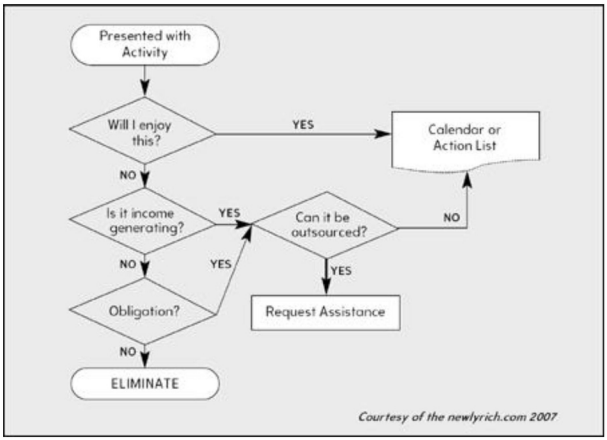
IN THE NEXT several chapters, the communication skills you develop with our virtual assistant experiment will be applied to a much larger and obscenely profitable playing field: automation. The extent to which you will outsource next makes delegation look like finger painting.

In the world of automation, not all business models are created equal. How do you assemble a business and coordinate all its parts without lifting a finger? How do you automate cash deposits in your bank account while avoiding the most common problems? It begins with understanding the options, the art of dodging information flow, and what we will call "muses."

The next chapter is a blueprint for the first step: a product.

Go with the Flow

Here is a flowchart of 4HWW from reader Jed Wood, who has used it for faster decision making, more output with less input, and more time with his wife and children.



► Q&A: QUESTIONS AND ACTIONS

1. **Get an assistant—even if you don't need one**.
Develop the comfort of commanding and not being commanded. Begin with a one-time test project or small repetitive task (daily preferred). I advise using domestic help for language-intensive tasks and using foreign assistants in the early stages to improve the general clarity of your communication. Pick one from each group and get started.

The following sites, split up geographically, are useful resources.

U.S. and Canada ($20/hour+)

http://www.iavoa.com (International Association of Virtual Office Assistants). Global directory that includes the U.S.

http://www.cvac.ca (Canadian Virtual Assistant Connection)

http://www.canadianva.net/files/va-locator.html (Canada)

www.onlinebusinessmanager.com

North America and International ($4/hour+)

www.elance.com (Search "virtual assistants," "personal assistants," and "executive assistants.") The client feedback reviews on Elance enabled me to find my best VA to date, who costs $4/hour. Similar marketplaces with positive reviews include www.guru.com and www.rentacoder.com.

India

www.tryasksunday.com ($20–60 per month for 24/7 concierge, free one-week trial). AskSunday is one of the sophisticated new kids on the personal outsourcing block. Their site was nominated the #2 website of the year in 2007 by *Time* magazine. Just dial a 212 (NYC) area code and get routed to well-spoken assistants in India and the Philippines. I use this service 80% of the time, as most tasks take less than 10 minues to complete. For longer projects, there are teams available for $12/hour.

www.b2kcorp.com ($15/hour+) From Fortune 10 oil companies and Fortune 500 clients to Big 5 accounting firms and U.S. congressmen, Brickwork can handle it all. This is reflected in the costs of this pure suit-and-tie operation—business only. No flowers for auntie.

www.taskseveryday.com ($6.98/hour for a dedicated virtual assistant) Based in Mumbai, available via phone and e-mail from the U.S., UK, and Australia. Must choose between 20 or 40 hours per week and pre-purchase hours.

www.yourmaninindia.com ($6.25/hour+) YMII handles both business and personal tasks and can work with you in real time (there are people on duty 24/7) and complete work while you sleep. English capability and effectiveness vary tremendously across VAs, so interview yours before getting started or assigning important tasks. Important: Following the publication of the first edition of this book, there have been some complaints of lower quality and up to four-week wait lists to become a client.

2. **Start small but think big**.

Tina Forsyth, an online business manager (higher-level VA) who helps six-figure-income clients achieve seven figures with business model redesigns, makes the following recommendations.

- ► Look at your to-do list—what has been sitting on it the longest?
- ► Each time you are interrupted or change tasks, ask, "Could a VA do this?"
- ► Examine pain points—what causes you the most frustration and boredom?

Here are a few common time-consumers in small businesses with online presences.

- ► Submitting articles to drive traffic to site and build mailing lists
- ► Participating in or moderating discussion forums and message boards
- ► Managing affiliate programs
- ► Creating content for and publishing newsletters and blog postings

- ► Background research components of new marketing initiatives or analysis of current marketing results

Don't expect miracles from a single VA, but don't expect too little, either. Let go of the controls a bit. Don't assign crap tasks that end up consuming rather than saving time. It makes little sense to spend 10–15 minutes sending an e-mail to India to get a price quote on a plane ticket when you could do the same online in 10 minutes and avoid all the subsequent back-and-forth.

Push outside your comfort zone—that is the entire point of the exercise.

It is always possible to reclaim a task for yourself if the VA proves incapable, so test the limits of their capabilities. Remember Brickwork's suggestion: Don't limit yourself.

3. **Identify your top five time-consuming non-work tasks and five personal tasks you could assign for sheer fun**.

4. **Keep in sync: scheduling and calendars**.
If you decide to have an assistant schedule appointments and add things to your calendar, it will be important to ensure what you both see is updated. There are several options:

BusySync (www.busysync.com) I have two Gmail accounts: one private account for me and one for my assistant, where general e-mail is sent. I use BusySync to synchronize her Google Calendar with iCal (Mac calendar) on my laptop. I have also used **SpanningSync** (www.spanningsync.com) successfully for the same purpose.

WebEx Office (www.weboffice.com) Share your calendar online while masking personal appointments. Can be synchronized with Outlook, and also offers document sharing and other assistant- or team-friendly features. I suggest you compare this to synchronizing your Outlook with an assistant's Google Calendar.

► COMFORT CHALLENGE

Use the Criticism Sandwich (2 Days and Weekly)

Chances are good that someone—be it a co-worker, boss, customer, or significant other—does something irritating or at a subpar level. Rather than avoid the topic out of fear of confrontation, let's chocolate-coat it and ask them to fix it. Once per day for two days, and then each Thursday (M-W is too tense and Friday is too relaxed) for the next three weeks, resolve to use what I call the Criticism Sandwich with someone. It's called the Criticism Sandwich because you first *praise* the person for something, then *deliver the criticism*, and then close with topic-shifting *praise* to exit the sensitive topic. Here's an example with a superior or boss, with keywords and phrases in italics.

You: Hi, Mara. Do you have a second?

Mara: Sure. What's up?

You: *First, I wanted to thank you for* helping me with the Meelie Worm account [or whatever]. *I really appreciate* you showing me how to handle that. *You're really good at* fixing the technical issues.

Mara: No problem.

You: *Here's the thing.*[16] There is a lot of work coming down on everyone, and *I'm feeling*[17] a bit overwhelmed. *Normally, priorities are really clear to me*[18] but I've been having trouble recently figuring

out which tasks are highest on the list. *Could you help me by* pointing out the most important items when a handful need to be done? *I'm sure it's just me,*[19] *but I'd really appreciate it, and I think it would help.*

Mara: Uhh … I'll see what I can do.

You: *That means a lot to me. Thanks. Before I forget,*[20] last week's presentation was excellent.

Mara: Did you think so? Blah, blah, blah …

► LIFESTYLE DESIGN IN ACTION

THE BEST TIMES TO SEND E-MAIL

You've suggested people check e-mail only a few times a day. Here's a twist: I reply to e-mails when it's convenient, but I time it to arrive when it's also convenient for me. In Outlook you can delay e-mail delivery to any time of day. For example, when I return e-mails at 3 p.m., I don't want my staff instantly zinging me responses or clarifying questions. (This also prevents e-mail chats.) So I hit send, but it's delayed to arrive later in the evening or at 8 A.M. when my employees arrive the next day. This is how e-mail was meant to be! It's mail, not a chat service.

—***JIM LARRANAGA***

14. To leverage global pricing and currency differences for profit or lifestyle purposes.

15. Information technology.

16. Don't call it a problem if you can avoid it.

17. No one can argue with your feelings, so use this to avoid a debate about external circumstances.

18. Notice how I take "you" out of the sentence to avoid finger-pointing, even though it's implicit. "Normally, you make priorities clear" sounds like a backhanded insult. If this is a significant other, you can skip this formality, but never use "you always do X," which is just a fight starter.

19. Take a little bit of the heat off with this. The point has already been made.

20. "Before I forget" is a great segue to the closing compliment, which is also a topic shifter and gets you off the sensitive topic without awkwardness.

9

Income Autopilot I

► FINDING THE MUSE

Just set it and forget it!

—RON POPEIL, founder of RONCO; responsible for more than $1 billion in sales of rotisserie chicken roasters

As to methods there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble.

—RALPH WALDO EMERSON

The Renaissance Minimalist

Douglas Price was waking up to another beautiful summer morning in his Brooklyn brownstone. First things first: coffee. The jet lag was minor, considering he had just returned from a two-week jaunt through the islands of Croatia. It was just one of six countries he had visited in the last 12 months. Japan was next on the agenda.

Buzzing with a smile and his coffee mug in hand, he ambled over to his Mac to check on personal e-mail first. There were 32 messages and all brought good news.

One of his friends and business partners, also a cofounder of Limewire, had an update: Last Bamboo, their start-up poised to reinvent peer-to-peer technology, was rounding the final corners of development. It could be their billion-dollar baby, but Doug was letting the engineers run wild first.

Samson Projects, one of the hottest contemporary art galleries in Boston, had compliments for Doug's latest work and requests for expanded involvement with new exhibits as their sound curator.

The last e-mail in his inbox was a fan letter addressed to "Demon Doc" and praise for his latest instrumental hip-hop album, *onliness v1.0.1*. Doug had released his album as what he termed "open source music"—anyone could download the album for free and use sounds from any track in his or her own compositions.

He smiled again, polished off his dark roast, and opened a window to deal with business e-mail next. It would take much less time. In fact, less than 30 minutes for the day and 2 hours for the week.

How much things change.

Two years earlier, in June of 2004, I was in Doug's apartment checking e-mail for what I hoped would be the last time for a long time. I was headed to JFK Airport in New York in a matter of hours and was preparing for an indefinite quest around the world. Doug looked on with amusement. He had similar plans for himself and was finally extricating himself from a venture-funded Internet startup that had once been a cover story and his passion but was now just a job. The euphoria of the dot-com era was long dead, along with most chances for a sale or an IPO.

He bid me farewell and made a decision as the taxi pulled from the curb—enough of the complicated stuff. It was time to return to basics.

Prosoundeffects.com, launched in January of 2005 after one week of sales testing on eBay, was designed to do one thing: give Doug lots of cash with minimal time investment.

This brings us back to his business inbox in 2006.

There are 10 orders for sound libraries, CDs that film producers, musicians, video game designers, and other audio professionals use to add hard-to-find sounds—whether the purr of a lemur or an exotic instrument—to their own creations. These are Doug's products, but he doesn't own them, as that would

require physical inventory and upfront cash. His business model is more elegant than that. Here is just one revenue stream:

1. A prospective customer sees his Pay-Per-Click (PPC) advertising on Google or other search engines and clicks through to his site, www.prosoundeffects.com.

2. The prospect orders a product for $325 (the average purchase price, though prices range from $29–7,500) on a Yahoo shopping cart, and a PDF with all their billing and shipping information is automatically e-mailed to Doug.

3. Three times a week, Doug presses a single button in the Yahoo management page to charge all his customers' credit cards and put cash in his bank account. Then he saves the PDFs as Excel purchase orders and e-mails the purchase orders to the manufacturers of the CD libraries. Those companies mail the products to Doug's customers—this is called drop-shipping—and Doug pays the manufacturers as little as 45% of the retail price of the products up to 90 days later (net-90 terms).

Let's look at the mathematical beauty of his system for full effect.

For each $325 order at his cost of 55% off retail, Doug is entitled to $178.75. If we subtract 1% of the full retail price (1% of $325 = $3.25) for the Yahoo Store transaction fee and 2.5% for the credit card processing fee (2.5% of $325 = $8.13), Doug is left with a pretax profit of $167.38 for this one sale.

Multiply this by 10 and we have $1673.80 in profit for 30 minutes of work. Doug is making $3,347.60 per hour and purchases no product in advance. His initial start-up costs were $1,200 for the webpage design, which he recouped in the first week. His PPC advertising costs approximately $700 per month and he pays Yahoo $99 per month for their hosting and shopping cart.

He works less than two hours a week, often pulls more than $10,000 per month, and there is no financial risk whatsoever.

Now Doug spends his time making music, traveling, and exploring new businesses for excitement. Prosoundeffects.com is not his end-all-be-all, but it has removed all financial concerns and freed his mind to focus on other things.

What would you do if you didn't have to think about money? If you follow the advice in this chapter, you will soon have to answer this question.

It's time to find your muse.

THERE ARE A million and one ways to make a million dollars. From franchising to freelance consulting, the list is endless. Fortunately, most of them are unsuited to our purpose. This chapter is not for people who want to *run* businesses but for those who want to *own* businesses and spend no time on them.

The response I get when I introduce this concept is more or less universal: Huh?

People can't believe that most of the ultrasuccessful companies in the world do not manufacture their own products, answer their own phones, ship their own products, or service their own customers. There are hundreds of companies that exist to pretend to work for someone else and handle these functions, providing rentable infrastructure to anyone who knows where to find them.

Think Microsoft manufactures the Xbox 360 or that Kodak designs and distributes their digital cameras? Guess again. Flextronics, a Singapore-based engineering and manufacturing firm with locations in 30 countries and $15.3 billion in annual revenue, does both. Most popular brands of mountain bikes in the U.S. are all manufactured in the same three or four plants in China. Dozens of call centers press one button to answer calls for the JC Penneys of the world, another to answer calls for the Dell Computers of the world, and yet another to answer calls for the New Rich like me.

It's all beautifully transparent and cheap.

Before we create this virtual architecture, however, we need a *product* to sell. If you own a service business, this section will help you convert expertise into a downloadable or shippable good to escape the limits of a per-hour-based model. If starting from scratch, ignore service businesses for now, as constant customer contact makes absence difficult.[21]

To narrow the field further, our target product can't take more than $500 to test, it has to lend itself to automation *within four weeks*, and—when up and running—it can't require more than *one day per week* of management.

Can a business be used to change the world, like The Body Shop or Patagonia? Yes, but that isn't our goal here.

Can a business be used to cash out through an IPO or sale? Yes, but that isn't our goal either.

Our goal is simple: to create an automated vehicle for generating cash without consuming time. That's it.[22] I will call this vehicle a "muse" whenever possible to separate it from the ambiguous term "business," which can refer to a lemonade stand or a Fortune 10 oil conglomerate—our objective is more limited and thus requires a more precise label.

So first things first: cash flow and time. With these two currencies, all other things are possible. Without them, nothing is possible.

Why to Begin with the End in Mind: A Cautionary Tale

Sarah is excited.

It has been two weeks since her line of humorous T-shirts for golfers went online, and she is averaging 5 T-shirt sales per day at $15 each. Her cost per unit is $5, so she is grossing $50 in profit (minus 3% in credit card fees) per 24 hours, as she passes shipping and handling on to customers. She should soon recoup the cost of her initial order of 300 shirts (including plate charges, setup, etc.)—but wants to earn more.

It's a nice reversal of fortune, considering the fate of her first product. She had spent $12,000 to develop, patent, and manufacture a high-tech stroller for new moms (she has never been a new mom), only to find that no one was interested.

The T-shirts, in contrast, were actually selling, but sales were beginning to slow.

It appears she has reached her online sales ceiling, as well-funded and uneducated competitors are now spending too much for advertising and driving up costs. Then it strikes her—retail!

Sarah approaches the manager of her local golf shop, Bill, who immediately expresses interest in carrying the shirts. She's thrilled.

Bill asks for the customary 40% minimum discount for wholesale pricing. This means her sell price is now $9 instead of $15 and her profit has dropped from $10 to $4. Sarah decides to give it a shot and does the same with three other stores in surrounding towns. The shirts begin to move off the shelves, but she soon realizes that her small profit is being eaten by extra hours she spends handling invoices and additional administration.

She decides to approach a distributor[23] to alleviate this labor, a company that acts as a shipping warehouse and sells products from various manufacturers to golf stores nationwide. The distributor is interested and asks for its usual pricing—70% off of retail or $4.50—which would leave Sarah 50 cents in the hole on each unit. She declines.

To make matters worse, the four local stores have already started discounting her shirts to compete among one another and are killing their own profit margins. Two weeks later, reorders disappear. Sarah abandons retail and returns to her website demoralized. Sales online have dropped to almost nothing with new competition. She has not recouped her initial investment, and she still has 50 shirts in her garage.

Not good.

It all could have been prevented with proper testing and planning.

ED "MR. CREATINE" BYRD is no Sarah. He does not invest and hope for the best.

His San Francisco–based company, MRI, had the top-selling sports supplement in the U.S. from 2002–2005, NO_2. It is still a top-seller despite dozens of imitators. He did it through smart testing, smart positioning, and brilliant distribution.

Prior to manufacturing, MRI first offered a low-priced book related to the product through ¼-page advertisements in men's health magazines. Once the need had been confirmed with a mountain of book orders, NO_2 was priced at an outrageous $79.95, positioned as the premium product on the market, and sold exclusively through GNC stores nationwide. No one else was permitted to sell it.

How can it make sense to turn away business? There are a few good reasons.

First, the more competing resellers there are, the faster your product goes extinct. This was one of Sarah's mistakes.

It works like this: Reseller A sells the product for your recommended advertised price of $50, then reseller B sells it for $45 to compete with A, and then C sells it for $40 to compete with A and B. In no time at all, no one is making profit from selling your product and reorders disappear. Customers are now accustomed to the lower pricing and the process is irreversible. The product is dead and you need to create a new product. This is precisely the reason why so many companies need to create new product after new product month after month. It's a headache.

I had one single supplement, BrainQUICKEN® (also sold as BodyQUICK®) for six years and maintained a consistent profit margin by limiting wholesale distribution, particularly online, to the top one or two largest resellers who could move serious quantities of product and who agreed to maintain a minimum advertised pricing.[24] Otherwise, rogue discounters on eBay and mom-and-pop independents will drive you broke.

Second, if you offer someone exclusivity, which most manufacturers try to avoid, it can work in your favor. Since you are offering one company 100% of the distribution, it is possible to negotiate better profit margins (offering less of a discount off of retail price), better marketing support in-store, faster payment, and other preferential treatment.

It is critical that you decide how you will sell and distribute your product before you commit to a product in the first place. The more middlemen are involved, the higher your margins must be to maintain profitability for all the links in the chain.

Ed Byrd realized this and exemplifies how doing the opposite of what most do can reduce risk and increase profit. Choosing distribution before product is just one example.

Ed drives a Lamborghini down the California coast when not traveling or in the office with his small focused staff and his two Australian shepherds. This outcome is not accidental. His product-creation methods—and those of the New Rich in general—can be emulated.

Here's how you do it in the fewest number of steps.

Step One: Pick an Affordably Reachable Niche Market

> When I was younger … I [didn't] want to be pigeonholed … Basically, now you want to be pigeonholed. It's your niche.
>
> —JOAN CHEN, actress; appeared in *The Last Emperor* and *Twin Peaks*

Creating demand is hard. Filling demand is much easier. Don't create a product, then seek someone to sell it to. Find a market—define your customers—then find or develop a product for them.

I have been a student and an athlete, so I developed products for those markets, focusing on the male demographic whenever possible. The audiobook I created for college guidance counselors failed because I have never been a guidance counselor. I developed the subsequent speed-reading seminar after realizing that I had free access to students, and the business succeeded because—being a student myself—I understood their needs and spending habits. Be a member of your target market and don't speculate what others need or will be willing to buy.

Start Small, Think Big

> Some people are just into lavish dwarf entertainment.
>
> –DANNY BLACK (42″), part-owner of Shortdwarf.com[25]

Danny Black rents dwarfs as entertainment for $149 per hour. How is that for a niche market?

It is said that if everyone is your customer, then no one is your customer. If you start off aiming to sell a product to dog- or car-lovers, stop. It's expensive to advertise to such a broad market, and you are competing with too many products and too much free information. If you focus on how to train German shepherds or a restoration product for antique Fords, on the other hand, the market and competition shrink, making it less expensive to reach your customers and easier to charge premium pricing.

BrainQUICKEN was initially designed for students, but the market proved too scattered and difficult to reach. Based on positive feedback from student-athletes, I relaunched the product as BodyQUICK and tested advertising in magazines specific to martial artists and powerlifters. These are minuscule markets compared to the massive student market, but not small. Low media cost and lack of competition enabled me to dominate with the first "neural accelerator"[26] in these niches. It is more profitable to be a big fish in a small pond than a small undefined fish in a big pond. How do you know if it's big enough to meet your TMI? For a detailed real-life example of how I determined the market size of a recent product, see "Muse Math" on this book's companion site.

Ask yourself the following questions to find profitable niches.

1. Which social, industry, and professional groups do you belong to, have you belonged to, or do you understand, whether dentists, engineers, rock climbers, recreational cyclists, car restoration aficionados, dancers, or other?

Look creatively at your resume, work experience, physical habits, and hobbies and compile a list of all the groups, past and present, that you can associate yourself with. Look at products and books you own, include online and offline subscriptions, and ask yourself, "What groups of people purchase the same?" Which magazines, websites, and newsletters do you read on a regular basis?

2. Which of the groups you identified have their own magazines?

Visit a large bookstore such as Barnes & Noble and browse the magazine rack for smaller specialty magazines to brainstorm additional niches. There are literally thousands of occupation- and interest/hobby-specific magazines to choose from. Use *Writer's Market* to identify magazine options outside the bookstores. Narrow the groups from question 1 above to those that are reachable through one or two small magazines. It's not important that these groups all have a lot of money (e.g., golfers)—only that they spend money (amateur athletes, bass fishermen, etc.) on products of some type. Call these magazines, speak to the advertising directors, and tell them that you are considering advertising; ask them to e-mail their current advertising rate card and include both readership numbers and magazine back-issue samples. Search the back issues for repeat advertisers who sell direct-to-consumer via 800 numbers or websites—the more repeat advertisers, and the more frequent their ads, the more profitable a magazine is for them … and will be for us.

Step Two: Brainstorm (Do Not Invest In) Products

> Genius is only a superior power of seeing.
>
> —JOHN RUSKIN, famed art and social critic

Pick the two markets that you are most familiar with that have their own magazines with full-page advertising that costs less than $5,000. There should be no fewer than 15,000 readers.

This is the fun part. Now we get to brainstorm or find products with these two markets in mind.

The goal is come up with well-formed product ideas and spend nothing; in Step 3, we will create advertising for them and test responses from real customers before investing in manufacturing. There are several criteria that ensure the end product will fit into an automated architecture.

The Main Benefit Should Be Encapsulated in One Sentence.

People can dislike you—and you often sell more by offending some—but they should never misunderstand you.

The main benefit of your product should be explainable in one sentence or phrase. How is it different and why should I buy it? ONE sentence or phrase, folks. Apple did an excellent job of this with the iPod. Instead of using the usual industry jargon with GB, bandwidth, and so forth, they simply said, "1,000 songs in your pocket." Done deal. Keep it simple and do not move ahead with a product until you can do this without confusing people.

It Should Cost the Customer $50–200.

The bulk of companies set prices in the midrange, and that is where the most competition is. Pricing low is shortsighted, because someone else is always willing to sacrifice more profit margin and drive you both bankrupt. Besides perceived value, there are three main benefits to creating a premium, high-end image and charging more than the competition.

1. Higher pricing means that we can sell fewer units—and thus manage fewer customers—and fulfill our dreamlines. It's faster.
2. Higher pricing attracts lower-maintenance customers (better credit, fewer complaints/questions,

fewer returns, etc.). It's less headache. This is HUGE.

3. Higher pricing also creates higher profit margins. It's safer.

I personally aim for an *8–10x markup*, which means a $100 product can't cost me more than $10–12.50.[27] If I had used the commonly recommended 5 x markup with BrainQUICKEN, it would have gone bankrupt within 6 months due to a dishonest supplier and late magazine. The profit margin saved it, and within 12 months it was generating up to $80,000 per month.

High has its limits, however. If the per-unit price is above a certain point, prospects need to speak to someone on the phone before they are comfortable enough to make the purchase. This is contraindicated on our low-information diet.

I have found that a price range of $50–200 per sale provides the most profit for the least customer service hassle. Price high and then justify.

It Should Take No More Than 3 to 4 Weeks to Manufacture.

This is critically important for keeping costs low and adapting to sales demand without stockpiling product in advance. I will not pursue any product that takes more than three to four weeks to manufacture, and I recommend aiming for one to two weeks from order placement to shippable product.

How do you know how long something takes to manufacture?

Contact contract manufacturers who specialize in the type of products you're considering: http://www.thomasnet.com/. Call a related manufacturer (e.g., toilet bowls) if you need a referral to a related manufacturer you cannot find (e.g., toilet cleaning solutions). Still no luck? Google different synonyms for your product in combination with "organization" and "association" to contact the appropriate industry organizations. Ask them for referrals to contract manufacturers and for the names of their trade magazines, which often contain advertisements for contract manufacturers and related service providers we'll need for your virtual architecture later. Request pricing from the contract manufacturers to ensure the proper markup is possible. Determine the per-unit costs of production for 100, 500, 1,000, and 5,000 units.

It Should Be Fully Explainable in a Good Online FAQ.

Here is where I really screwed up in my product choice with Brain-QUICKEN.

Even though ingestibles have enabled my **NR** life, I would not wish them on anyone. Why not? You get 1,000 questions from every customer: Can I eat bananas with your product? Will it make me fart during dinner? On and on, ad nauseam. Choose a product that you can fully explain in a good online FAQ. If not, the task of travelling and otherwise forgetting about work becomes very difficult or you end up spending a fortune on call center operators.

Understanding these criteria, a question remains: "How does one obtain a good muse product that satisfies them?" There are three options we'll cover in ascending order of recommendation.

Option One: Resell a Product

Purchasing an existing product at wholesale and reselling it is the easiest route but also the least

profitable. It is the fastest to set up but the fastest to die off due to price competition with other resellers. The profitable life span of each product is short unless an exclusivity agreement prevents others from selling it. Reselling is, however, an excellent option for secondary back-end[28] products that can be sold to existing customers or cross-sold[29] to new customers online or on the phone.

To purchase at wholesale, use these steps.

1. Contact the manufacturer and request a "wholesale pricelist" (generally 40% off retail) and terms.
2. If a business tax ID number is needed, print out the proper forms from your state's Secretary of State website and file for an LLC (which I prefer) or similar protective business structure for $100–200.

Do NOT purchase product until you have completed Step 3 in the next chapter. It is enough at this point to confirm the profit margin and have product photos and sales literature.

That's reselling. Not much more to it.

Option Two: License a Product

I not only use all the brains that I have, but all that I can borrow.

—WOODROW WILSON

Some of the world's best-known brands and products have been borrowed from someone or somewhere else.

The basis for the energy drink Red Bull came from a tonic in Thailand, and the Smurfs were brought from Belgium. Pokémon came from the land of Honda. The band KISS made millions in record and concert sales, but the real profit has been in licensing—granting others the right to produce hundreds of products with their name and image in exchange for a percentage of sales.

There are two parties involved in a licensing deal, and a member of the New Rich could be either. First, there is the inventor of the product,[30] called the "licensor," who can sell others the right to manufacture, use, or sell his or her product, usually for 3–10% of the wholesale price (usually around 40% off retail) for each unit sold. Invent, let someone else do the rest, and cash checks. Not a bad model.

The other side of the equation is the person interested in manufacturing and selling the inventor's product for *90–97%* of the profit: the licensee. This is, for me and most **NR**, more interesting.

Licensing is, however, dealmaking-intensive on both sides and a science unto itself. Creative contract negotiation is essential and most readers will run into problems if it's their first product. For real-world case studies on both sides, ranging from Teddy Ruxpin to Tae-Bo, and full agreements with actual dollar amounts, visit www.fourhourblog.com. From how to sell inventions without prototypes or patents to how to secure rights to products as a no-name beginner, it's all there. The economics are fascinating and the profits can be astounding.

In the meantime, we will focus on the least complicated and most profitable option open to the most people: product creation.

Option Three: Create a Product

> Creation is a better means of self-expression than possession; it is through creating, not possessing, that life is revealed.
>
> —VIDA D. SCUDDER, *The Life of the Spirit in the Modern English Poets*

Creating a product is not complicated. "Create" sounds more involved than it actually is. If the idea is a hard product—an invention—it is possible to hire mechanical engineers or industrial designers on www.elance.com to develop a prototype based on your description of its function and appearance, which is then taken to a contract manufacturer. If you find a generic or stock product made by a contract manufacturer that can be re-purposed or positioned for a special market, it's even easier: Have them manufacture it, stick a custom label on it for you, and presto—new product. This latter example is often referred to as "private labeling." Have you ever seen a massage therapist's office with its own line of vitamin products or the Kirkland brand at Costco? Private labeling in action.

It is true that we'll be testing market response without manufacturing, but if the test is successful, manufacturing is the next step. This means we need to keep in mind setup costs, per-unit costs, and order minimums. Innovative gadgets and devices are great but often require special tooling, which makes the manufacturing start-up costs too expensive to meet our criteria.

Putting mechanical devices aside and forgetting about welding and engineering, there is one class of product that meets all of our criteria, has a manufacturing lead time of less than a week in small quantities, and often permits not just an 8–10 **x** markup, but a 20–50 **x** markup.

No, not heroin or slave labor. Too much bribing and human interaction required.

Information.

Information products are low-cost, fast to manufacture, and time-consuming for competitors to duplicate. Consider that the top-selling non-information infomercial products—whether exercise equipment or supplements—have a useful life span of two to four months before imitators flood the market. I studied economics in Beijing for six months and observed firsthand how the latest Nike sneaker or Callaway golf club could be duplicated and on eBay within a week of first appearing on shelves in the U.S. This is not an exaggeration, and I am not talking about a look-alike product—I mean an exact duplicate for 1/20 the cost.

Information, on the other hand, is too time-consuming for most knockoff artists to bother with when there are easier products to replicate. It's easier to circumvent a patent than to paraphrase an entire course to avoid copyright infringement. Three of the most successful television products of all time—all of which have spent more than 300 weeks on the infomercial top-10 bestseller lists—reflect the competitive and profit margin advantage of information products.

No Down Payment (Carlton Sheets)
Attacking Anxiety and Depression (Lucinda Bassett)
Personal Power (Tony Robbins)

I know from conversations with the principal owners of one of the above products that more than $65 million worth of information moved through their doors in 2002. Their infrastructure consisted of fewer than 25 in-house operators, and the rest of the infrastructure, ranging from media purchasing to shipping, was outsourced.

Their annual revenue-per-employee is more than $2.7 million. Incredible.

On the opposite end of the market size spectrum, I know a man who created a low-budget how-to DVD for less than $200 and sold it to owners of storage facilities who wanted to install security systems. It's hard to get more niche than that. In 2001, selling DVDs that cost $2 to duplicate for $95 apiece through trade magazines, he made several hundred thousand dollars with no employees.

But I'm Not an Expert!

If you aren't an expert, don't sweat it.

First, "expert" in the context of selling product means that you know more about the topic than the purchaser. No more. It is not necessary to be the best—just better than a small target number of your prospective customers. Let's suppose that your current dreamline—to compete in the 1,150-mile Iditarod dogsledding race in Alaska—requires $5,000 to realize. If there are 15,000 readers and even 50 (0.33%) can be convinced of your superior expertise in skill X and spend $100 for a program that teaches it, that is $5,000. Bring on the Huskies. Those 50 customers are what I call the "minimal customer base"—the minimum number of customers you need to convince of your expertise to fulfill a given dreamline.

Second, expert status can be created in less than four weeks if you understand basic credibility indicators. It's important to learn how the PR pros phrase resume points and position their clients. See the boxed text later in this chapter to learn how.

The degree to which you personally need expert status also depends on how you obtain your content. There are three main options.

1. Create the content yourself, often via paraphrasing and combining points from several books on a topic.
2. Repurpose content that is in the public domain and not subject to copyright protection, such as government documents and material that predates modern copyright law.
3. License content or compensate an expert to help create content. Fees can be one-time and paid up front or royalty-based (5–10% of net revenue, for example).

If you choose option 1 or 2, you need expert status within a limited market.

Let's assume you are a real estate broker and have determined that, like yourself, most brokers want a simple but good website to promote themselves and their businesses. If you read and understand the three top-selling books on home-page design, you will know more about that topic than 80% of the readership of a magazine for real estate brokers. If you can summarize the content and make recommendations specific to the needs of the real estate market, a 0.5–1.5% response from an ad you place in the magazine is not unreasonable to expect.

Use the following questions to brainstorm potential how-to or informational products that can be sold to your markets using your expertise or borrowed expertise. Aim for a combination of formats that will lend itself to $50–200 pricing, such as a combination of two CDs (30–90 minutes each), a 40-page transcription of the CDs, and a 10-page quickstart guide. Digital delivery is perfectly acceptable—in some cases, ideal—if you can create a high enough perceived value.

1. How can you tailor a general skill for your market—what I call "niching down"—or add to what is being sold successfully in your target magazines? Think narrow and deep rather than broad.

2. What skills are you interested in that you—and others in your markets—would pay to learn? Become an expert in this skill for yourself and then create a product to teach the same. If you need help or want

to speed up the process, consider the next question.

3. What experts could you interview and record to create a sellable audio CD? These people do not need to be the best, but just better than most. Offer them a digital master copy of the interview to do with or sell as they like (this is often enough) and/or offer them a small up-front or ongoing royalty payment. Use Skype.com with HotRecorder (more on these and related tools in Tools and Tricks) to record these conversations directly to your PC and send the mp3 file to an online transcription service.

4. Do you have a failure-to-success story that could be turned into a how-to product for others? Consider problems you've overcome in the past, both professional and personal.

The Expert Builder: How to Become a Top Expert in 4 Weeks

It's time to obliterate the cult of the expert. Let the PR world scorn me. First and foremost, there is a difference between *being perceived* as an expert and *being* one. In the context of business, the former is what sells product and the latter, relative to your "minimal customer base," is what creates good products and prevents returns.

It is possible to know all there is to know about a subject—medicine, for example—but if you don't have M.D. at the end of your name, few will listen. The M.D. is what I term a "credibility indicator." The so-called expert with the most credibility indicators, whether acronyms or affiliations, is often the most successful in the marketplace, even if other candidates have more in-depth knowledge. This is a matter of superior positioning, not deception.

How, then, do we go about acquiring credibility indicators in the least time possible? Emulating the client-grooming techniques of some of the best PR firms in New York City and Los Angeles isn't a bad place to start.

It took a friend of mine just three weeks to become a "top relationship expert who, as featured in *Glamour* and other national media, has counseled executives at Fortune 500 companies on how to improve their relationships in 24 hours or less." How did she do it?

She followed a few simple steps that created a credibility snowball effect. Here's how you can do the same.

1. **Join two or three related trade organizations** with official-sounding names. In her case, she chose the Association for Conflict Resolution (www.acrnet.org) and The International Foundation for Gender Education (www.ifge.org). This can be done online in five minutes with a credit card.

2. **Read the three top-selling books** on your topic (search historical *New York Times* bestseller lists online) and summarize each on one page.

3. **Give one free one-to-three-hour seminar** at the closest well-known university, using posters to advertise. Then do the same at branches of two well-known big companies (AT&T, IBM, etc.) located in the same area. Tell the company that you have given seminars at University X or X College and are a member of those groups from step 1. Emphasize that you are offering it to them for free to get additional speaking experience outside of academics and will not be selling products or services. Record the seminars from two angles for later potential use as a CD/DVD product.

4. **Optional: Offer to write one or two articles for trade magazines** related to your topics, citing what you have accomplished in steps 1 and 3 for credibility. If they decline, offer to interview a known expert and write the article—it still gets your name listed as a contributor.

5. **Join ProfNet**, which is a service that journalists use to find experts to quote for articles. Getting PR is simple if you stop shouting and start listening. Use steps 1, 3, and 4 to demonstrate credibility and

online research to respond to journalist queries. Done properly, this will get you featured in media ranging from small local publications to the *New York Times* and ABC News.

Becoming a recognized expert isn't difficult, so I want to remove that barrier now.

I am not recommending pretending to be something you're not. I can't! "Expert" is nebulous media-speak and so overused as to be indefinable. In modern PR terms, proof of expertise in most fields is shown with group affiliations, client lists, writing credentials, and media mentions, not *IQ* points or Ph.D.s.

Presenting the truth in the best light, but not fabricating it, is the name of the game.

See you on CNN.

► Q&A: QUESTIONS AND ACTIONS

For this hands-on chapter, the Q&A is simple. In fact, it's more like a Q.

The question is, "Did you read the chapter and follow the directions?" If not, do it! Instead of the usual Q&A, the end of this chapter and the following two will feature more extensive resources for taking the action steps described in detail in the text.

► COMFORT CHALLENGE

Find Yoda (3 Days)

Call at least one potential superstar mentor per day for three days. E-mail only after attempting a phone call. I recommend calling before 8:30 A.M. or after 6:00 P.M. to reduce run-ins with secretaries and other gatekeepers. Have a single question in mind, one that you have researched but have been unable to answer yourself. Shoot for "A" players—CEOs, ultrasuccessful entrepreneurs, famous authors, etc.—and don't aim low to make it less frightening. Use www.contactanycelebrity.com if need be, and base your script on the following.

Unknown answerer: This is Acme Inc. [or "the office of Mentor X"].

You: Hi, this is Tim Ferriss calling for John Grisham, please.[31]

Answerer: May I ask what this is regarding?

You: Sure. I know this might sound a bit odd,[32] but I'm a first-time author and just read his interview in *Time Out New York*.[33] I'm a longtime[34] fan and have finally built up the courage to[35] call him for one specific piece of advice. It wouldn't take more than two minutes of his time. Is there any way you can help me get through to him?[36] I really, really appreciate whatever you can do.

Answerer: Hmmm … Just a second. Let me see if he's available. [two minutes later] Here you go. Good luck. [rings to another line]

John Grisham: John Grisham here.

You: Hi, Mr. Grisham. My name is Tim Ferriss. I know this might sound a bit odd, but I'm a first-time author and a longtime fan. I just read your interview in *Time Out New York* and finally built up the courage to call. I have wanted to ask you for a specific piece of advice for a long time, and it shouldn't take more than two minutes of your time. May I?[37]

John Grisham: Uh … OK. Go ahead. I have to be on a call in a few minutes.

You (at the very end of the call)**:** Thank you so much for being so generous with your time. If I have the occasional tough question—very occasional—is there any chance I could keep in touch via e-mail?[38]

► LIFESTYLE DESIGN IN ACTION

OVER THE MOON

My 13-year-old daughter would like to be an astronaut when she grows up. Last year she had an extreme challenge to deal with. The phrase from *Apollo 13* "Failure is not an option" sort of became our motto. I got the idea of contacting the commander of *Apollo 13*, Jim Lovell. It didn't take much to find him and he sent her a wonderful letter about his ordeal just to get into the *Apollo* program, not to mention dealing with a crippled spacecraft. His letter made a big difference to my daughter. A couple months later, we were able to take things a little further by getting her VIP access to a shuttle launch.

—ROB

► TOOLS AND TRICKS

Confirming Sufficient Market Size

►Compete (www.compete.com) and
Quantcast (www.quantcast.com)

Find the number of monthly visitors for most websites, in addition to the search terms that generate the most traffic for them.

► Writer's Market (www.writersmarket.com)

Here you'll find a listing of thousands of specialty and niche magazines, including circulation and subscription numbers. I prefer the print version.

► Spyfu (www.spyfu.com)

Download competitors' online advertising spending, keywords, and ad-word details. Consistent and repeat spending generally indicates successful advertising ROI.

► **Standard Rate and Data Services (www.srds.com)**

Check out this resource for annual listings of magazine and company customer mailing lists available for rent. If you're considering creating a how-to video for duck hunting, check out the size of customer lists from hunting gun manufacturers and related magazines first. Use the print version in libraries instead of paying for the somewhat confusing online access.

Finding Products to Resell or Manufacturing

► **Affiliate Networks: Clickbank (www.clickbank.com), Commission Junction (www.cj.com), Amazon Associates (www.amazon.com/associates)**

No inventory, no invoices. Experimenting with products and categories through affiliate networks such as Clickbank and Commission Junction, which pay you 10–75% of each purchase, is a fast method for doing a proof-of-concept using similar products. It's often worth setting up accounts at both just to observe how bestselling items are being sold and promoted.

Amazon Associates averages 7–10% commissions, but bestselling books are excellent for testing target markets for more elaborate informational products. For all of the above: Do not get into bidding wars against other affiliates using expensive general keywords or overexposed brand names. Go niche or go broke.

► **Alibaba (www.alibaba.com)**

Based in China, Alibaba is the world's largest business-to-business marketplace. From MP3 players for $9 each to red wine for $2 per bottle, this site is the source. If someone here doesn't make it, it probably can't be made.

► **Worldwide Brands (www.worldwidebrands.com)**

Offers an extensive how-to guide for finding manufacturers willing to dropship product to your customers, which allows you to avoid pre-purchasing inventory. This is where Amazon and eBay power users find not just drop shippers, but also wholesalers and liquidators. Shopster (www.shopster.com) is also a popular option, with more than 1,000,000 dropship products to choose from.

► **Thomas's Register of Manufacturers (www.thomasnet.com) (800–699–9822)**

Searchable database of contract manufacturers for every conceivable product, from underwear and food products to airplane parts.

► **Electronics, DVDs, Books (www.ingrambook.com , www.techdata.com)**

► **Housewares and Hardware (www.housewares.org , www.nationalhardwareshow.com) (847–292–4200)**

For these product categories and related talent (on-screen demonstrations), also consider attending local or state fairs.

► **Consumables and Vitamin Products (www.expoeast.com , expowest.com)**

Finding Public Domain Information to Repurpose

Be sure to speak with an intellectual property attorney before using apparent public domain material. If someone modifies 20% of a public domain work (through abridging and footnotes, for example), their "new" complete work can be copyrighted. Using it without permission would then be a punishable infringement. The details can get confusing. Do the beginning research yourself, but get a pro to look over your findings before moving ahead with product development.

► **Project Gutenberg (www.gutenberg.org)**

Project Gutenberg is a digital library of more than 15,000 pieces of literature considered to be in the public domain.

► **LibriVox (www.librivox.org)**

LibriVox is a collection of audiobooks from the public domain that are available for free download.

Recording Seminars or Phone Interviews with Experts for CD Downloadable Products

► **HotRecorder (www.hotrecorder.com) (PC), Call Recorder (http://ecamm.com/mac/callrecorder/) (Mac)**

Use these programs to record any inbound or outbound phone call via computer using Skype (www.skype.com) and other VoIP programs.

► **NoCost Conference (www.nocostconference.com)**

Provides a free 800-number conference line, as well as free recording and file retrieval. Normal phones can be used for call-in, so no computer or web connection is required for participants. If you'll have a Q&A, I suggest soliciting attendee questions beforehand to avoid issues with muting/ unmuting of lines.

► **Jing Project (www.jingproject.com)** and **DimDim (www.dimdim.com)**

If you'd like to record the actions on your screen for video tutorials, both of these free programs will get the job done. If you need advanced editing features, Jing's big brother Camtasia is the industry standard (www.camtasia.com).

Licensing Ideas to Others for Royalties

► **InventRight (www.inventright.com) (800–701–7993)**

Stephen Key is the most consistently successful inventor I've ever met, with millions in royalties from companies like Disney, Nestlé, and Coca-Cola. He is not high-tech but specializes in creating simple products, or improving on existing products, and then licensing (renting) his ideas to large corporations. He comes up with the idea, files a provisional patent for less than $200, and then lets another company do the work while he collects checks. This site introduces his fail-proof process for doing the same. His techniques for cold-calling alone are invaluable. Highly recommended.

►**Guthy-Renker Corporation (www.guthyrenker.com) (760–773–9022)** GRC is the 800-pound infomercial gorilla. It brings in more than $1.3 billion per year in sales with mega-hits like Tony Robbins, Proactiv Solution, and Winsor Pilates. Don't expect more than a 2–4% royalty if you make the cut, but the numbers are huge enough to make it worth a look. Submit your product online.

Searching Patents for Unexploited Ideas to Turn into Products

- ► **United States Patent and Trademark Office (www.uspto.gov) (800–786–9199)**
- ► **Licensable Technologies Developed at Universities (www.autm.net ;** see "view all listings" under "Technology Transfer Offices")
- ► **Inventors Groups and Associations** (call and ask if members have anything to license) (**www.uiausa.org/Resources/InventorGroups.htm**

Becoming an Expert

►**Prof Net via PR Leads (www.prleads.com)** and **HARO (www.helpareporterout.com)**

Receive daily leads from journalists and TV and radio producers looking for experts to cite and interview for media ranging from local outlets to CNN and the *New York Times*. Stop swimming upstream and start responding to stories people are already working on. HARO offers select leads at no cost, and you

can mention my name with PR Leads to get two months for the price of one.

►**PRWeb Press Releases (www.prwebdirect.com)** The press release is dead for most purposes, but using this service has some serious search-engine benefits, such as appearing at the top of related Google News and Yahoo! News results.

► **ExpertClick (www.expertclick.com)**

This is another secret of the PR pros. Put up an expert profile for media to see, receive an up-to-date database of top media contacts, and send free press releases to 12,000 journalists, all on one website that gets more than 5 million hits per month. This is how I got on NBC and ended up developing a prime-time TV show. It works. Mention my name on the phone, or use "Tim Ferriss $100" online, to get a $100 discount.

► LIFESTYLE DESIGN IN ACTION

Bon Jour Tim,

I was in Barnes & Noble at the help desk this past Saturday, April 25, waiting for an employee to get a book for me *(Tropic of Cancer if* you must know). While I was waiting, I noticed a copy of *4-Hour Workweek* on the counter that someone else had ordered. Not one to be shy, I reached over the counter and started reading their copy. As you might guess, I had the employee go back and get me my own copy. Haven't finished *Tropic of Cancer* but finished your book …

… On Monday I got a yes when I asked my boss to work two days remotely per week. I start next week.

On Monday I also booked the most stunning apartment in Paris for the month of September, at a cost of half of the rent I pay in Southern California. I plan to increase my remote time now through August so that September will be an easy ask to leave for remote work. If the answer happens to be no (which I now doubt), I will be prepared to quit my job.

Now at work on my Income Autopilot project.

Tim: amazing. My life has changed in three days. (Plus, your book was funny as hell.) Thank you!!! ***—CINDY FRANKEY***

21. There are a few limited exceptions, such as online membership sites that don't require content generation, but as a general rule, products require much less maintenance and will get you to your TMI faster.

22. Muses will provide the time and financial freedom to realize your dreamlines in record time, after which one can (and often does) start additional companies to change the world or sell.

23. Distributors are sometimes also referred to as "wholesalers," depending on the industry.

24. It is illegal to control how much someone sells your product for, but you can dictate how much they advertise it for. This is done by including a Minimum Advertised Pricing (MAP) policy in your General Terms and Conditions (GTC), which are agreed to automatically when a written wholesale order is placed. Sample GTC and order forms are available at www.fourhourblog.com.

25. *The Wall Street Journal*, July 18, 2005 (http://www.technologyinvestor.com/login/2004/Jul18-05.php).

26. This was a new product category that I created to eliminate and preempt the competition. Strive to be the largest, best, or first in a precise category. I prefer being first.

27. If you decide to resell someone else's higher-end products like Doug, especially with drop-shipping, the risk is lower and smaller margins can suffice.

28. "Back-end" products are products sold to customers once the sale of a primary product has been made. iPod covers and car GPS systems are two examples. These products can have lower margins, because there is no advertising cost to acquire the customer.

29. "Cross-selling" is selling a related product to a customer while they're still on the phone or in an online shopping cart after the sale of a primary product has been made. For a full marketing and direct response (DR) glossary, visit www.fourhourblog.com.

30. This also refers to owners of copyrights or trademarks.

31. Said casually and with confidence, this alone will get you through surprisingly often. "I'd like to speak with Mr./Ms. X, please" is a dead giveaway that you don't know them. If you want to up the chances of getting though but risk looking foolish if they call the bluff, ask for the target mentor by first name only.

32. I use this type of lead-in whenever making off-the-wall requests. It softens it and makes the person curious enough to listen before spitting out an automatic "no."

33. This answers the questions they'll have in their head: "Who are you and why are you calling now?" I like to be a "first-time" something to play the sympathy card, and I find a recent media feature online to cite as the trigger for calling.

34. I call people I'm familiar with. If you can't call yourself a longtime fan, tell them that you have followed the mentor's career or business exploits for a certain number of years.

35. Don't pretend to be strong. Make it clear you're nervous and they'll lower their guard. I often do this even if I'm not nervous.

36. The wording here is critical. Ask them to "help" you do something.

37. Just rework the gatekeeper paragraph for this, and don't dillydally—get to the point quickly and ask for permission to pull the trigger.

38. End the conversation by opening the door for future contact. Start with e-mail and let the mentoring relationship develop from there.

10

Income Autopilot II

► TESTING THE MUSE

> Many of these theories have been killed off only when some decisive experiment exposed their incorrectness.... Thus the yeoman work in any science ... is done by the experimentalist, who must keep the theoreticians honest.
>
> —MICHIO KAKU, theoretical physicist and cocreator of String Field Theory, *Hyperspace*

Fewer than 5% of the 195,000 books published each year sell more than 5,000 copies. Teams of publishers and editors with decades of combined experience fail more times than not. The founder of Border's Books lost $375 million of investor funding with WebVan,[39] a nationwide grocery delivery service. The problem? No one wanted it.

The moral is that intuition and experience are poor predictors of which products and businesses will be profitable. Focus groups are equally misleading. Ask ten people if they would buy your product. Then tell those who said "yes" that you have ten units in your car and ask them to buy. The initial positive responses, given by people who want to be liked and aim to please, become polite refusals as soon as real money is at stake.

To get an accurate indicator of commercial viability, don't ask people if they would buy—ask them to buy. The response to the second is the only one that matters. The approach of the **NR** reflects this.

Step Three: Micro-Test Your Products

Micro-testing involves using inexpensive advertisements to test consumer response to a product prior to manufacturing.[40]

In the pre-Internet era, this was done using small classified ads in newspapers or magazines that led prospects to call a prerecorded sales message. Prospects would leave their contact information, and based on the number of callers or response to a follow-up sales letter, the product would be abandoned or manufactured.

In the Internet era, there are better tools that are both cheaper and faster. We'll test the product ideas from the last chapter on Google Adwords—the largest and most sophisticated Pay-Per-Click (PPC) engine—in five days for $500 or less. PPC here refers to the highlighted search results that are listed above and to the right of normal search results on Google. Advertisers pay to have these ads displayed when people search for a certain term related to the advertisers' product, such as "cognitive supplement," and are charged a small fee from $.05 to over $1 each time someone clicks through to their site. For a good introduction to Google Adwords and PPC, visit www.google.com/onlinebusiness. For expanded examples of the following PPC strategies, visit www.fourhourblog.com and search "PPC."

The basic test process consists of three parts, each of which is covered in this chapter.

Best: Look at the competition and create a more-compelling offer on a basic one-to-three-page website (one to three hours).

Test: Test the offer using short Google Adwords advertising campaigns (three hours to set up and five days of passive observation).

Divest or Invest: Cut losses with losers and manufacture the winner(s) for sales rollout.

Let's use two people, Sherwood and Johanna, and their two product ideas—French sailor shirts and a how-to yoga DVD for rock climbers—as case studies of what the testing steps look like and how you can do the same.

Sherwood bought a striped sailing shirt in France while traveling last summer, and upon returning to NYC has been continually approached by 20–30-year-old males on the street who want to know where to get their own. Sensing an opportunity, he requests back issues of NYC-based weekly magazines aimed at this demographic and calls the manufacturer in France for pricing. He learns that he can purchase shirts at a wholesale price of $20 that sell for $100 retail. He adds $5 per shirt to account for shipping to the U.S. and arrives at a per-shirt cost of $25. It's not quite our ideal markup (4x vs. 8–10x), but he wants to test the product regardless.

Johanna is a yoga instructor who has noticed her growing client base of rock climbers. She is also a rock climber and is considering creating a yoga instructional DVD tailored to that sport, which would include a 20-page spiral-bound manual and be priced at $80. She predicts that production of a low-budget first edition of the DVD would cost nothing more than a borrowed digital camera and a friend's iMac for simple editing. She can burn small quantities of this first-edition DVD—no menus, just straight footage and titles—on the laptop and create labels with freeware from www.download.com. She has contacted a duplication house and learned that more-professional DVDs will cost $3–5 apiece to duplicate in small quantities (minimum of 250), including cases.

Now that they have ideas and estimates of start-up costs, what next?

Besting the Competition

First and foremost, each product must pass a competitive litmus test. How can Sherwood and Johanna beat the competition and offer a superior product or guarantee?

1. Sherwood and Johanna Google the top terms each would use to try and find their respective products. To come up with related terms and derivative terms, both use search term suggestion tools.

Google Adwords Keyword Tool (http://adwords.google.com/select/KeywordToolExternal) Enter the potential search terms to find search volume and alternative terms with more search traffic. Click on the "Approx Avg Search Volume" column to sort results from most to least searched.

SEOBook Keyword Tool, SEO for Firefox Extension (http://tools.seobook.com/) This is an outstanding resource page with searches powered by Wordtracker (www.wordtracker.com).

Both then visit the three websites that consistently appear in top search and PPC positions. How can Sherwood and Johanna differentiate themselves?

- ► Use more credibility indicators? (media, academia, associations, and testimonials)
- ► Create a better guarantee?
- ► Offer better selection? [41]
- ► Free or faster shipping?

Sherwood notices that the shirts are often hard to find on the competitive sites, all of which feature dozens of products, and the shirts are either made in the U.S. (inauthentic) or shipped from France (customers must wait two to four weeks). Johanna cannot find a "yoga for rock climbing" DVD, so she is starting from a blank slate.

2. Sherwood and Johanna now need to create a one-page (300–600 words) testimonial-rich advertisement that emphasizes their differentiators and product benefits using text and either personal photos or stock photos from stock photo websites. Both have spent two weeks collecting advertisements that have prompted them to make purchases or that have caught their attention in print or online—these will serve as models.[42] Johanna asks her clients for testimonials and Sherwood lets his friends try on the shirts to get several for his page. Sherwood also asks the manufacturer for photos and advertising samples.

See www.pxmethod.com for a good example of how I have created a test page using testimonials from seminar attendees. Please note that it's just a template for readers and not a live sales page. Free how-to seminars as recommended in the Expert Builder are ideal for identifying popular selling points and securing testimonials.

Testing the Advertisement

Sherwood and Johanna now need to test actual customer response to their advertisements. Sherwood first tests his concept with a 72-hour eBay auction that includes his advertising text. He sets the "reserve" (the lowest price he'll accept) for one shirt at $50 and cancels the auction last minute to avoid legal issues since he doesn't have product to ship. He has received bids up to $75 and decides to move to the next phase of testing. Johanna doesn't feel comfortable with the apparent deception and skips this preliminary testing.

Sherwood's cost: <$5.

Both register domain names for their soon-to-be one-page sites using the cheap domain registrar www.domainsinseconds.com. Sherwood chooses www.shirtsfromfrance.com and Johanna chooses www.yogaclimber.com. For additional domain names, Johanna uses www.domainsinseconds.com.

Cost to both: <$20.

Sherwood uses www.weebly.com to create his one-page site advertisement and then creates two additional pages using the form builder www.wufoo.com. If someone clicks on the "purchase" button at the bottom of the first page, it takes them to a second page with pricing, shipping and handling,[43] and basic contact fields to fill out (including e-mail and phone). If the visitor presses "continue with order," it takes them to a page that states, "Unfortunately, we are currently on back order but will contact you as soon as we have product in stock. Thank you for your patience." This structure allows him to test the first-page ad and his pricing separately. If someone gets to the last page, it is considered an order.

Johanna is not comfortable with "dry testing," as Sherwood's approach is known, even though it is legal if the billing data isn't captured. She instead uses the same two services to create a single webpage with the content of her one-page ad and an e-mail sign-up for a free "top 10 tips" list for using yoga for rock climbing. She will consider 60% of the sign-ups as hypothetical orders.

Cost to both: <$0.

Both set up simple Google Adwords campaigns with 50–100 search terms to simultaneously test headlines while driving traffic to their pages. Their daily budget limits are set at $50 per day. (At this segue into PPC testing, I recommend you first visit www.adwords/google.com/onlinebusiness and then follow along by creating your own account, which should take about 10 minutes. It would be a waste of rain forests to use ten pages to explain terms that can be understood at a glance online.)

Sherwood and Johanna decide on the best search terms by using the search term suggestion tools mentioned earlier. Both aim for specific terms when possible ("french sailor shirts" vs. "french shirts;" "yoga for sports" vs. "yoga") for higher conversion rates (the percentage of visitors that purchase) and lower cost-per-click (CPC). They aim also for second through fourth positioning, but no more than $.20 CPC.

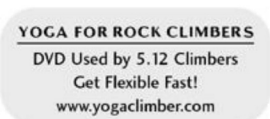
Sherwood will use Google's free analytical tools to track "orders" and page abandonment rates—what percentage of visitors leave the site from which pages. Johanna will use www.wufoo.com to track e-mail sign-ups on this small testing scale.[44]

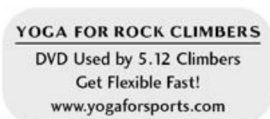
Cost to both: $0.

Both Johanna and Sherwood design Adwords ads that focus on their differentiators. Each Google Adwords ad consists of a headline and then two lines of description, neither of which can exceed 35 characters. In Sherwood's case, he creates five groups of 10 search terms each. The following are two of his ads.

SAILOR SHIRTS FROM FRANCE

Johanna creates the same five groups of 10 terms each and tests a number of ads, including these:





Notice that these ads can be used to test not just headlines but guarantees, product names, and domain names. It's as simple as creating several ads, rotated automatically by Google, that are identical except for the one variable to be tested. How do you think I determined the best title for this book?

Both Sherwood and Johanna disable the feature on Google that serves only the best-performing ad. This is necessary to later compare the click-through rates from each and combine the best elements (headline, domain name, and body text) into a final ad.

Last but not least, ensure that the ads don't trick prospects into visiting the site. The product offer should be clear. Our goal is qualified traffic, so we do not want to offer something "free" or otherwise attract window shoppers or the curious who are unlikely to buy.

Cost to both: $50 or less per day **x** 5 days = $250.[45]

Investing or Divesting

Five days later, it's time to tally the results.

What can we consider a "good" click-through and conversion rate? This is where the math can be deceiving. If we're selling a $10,000 abominable snowman suit with an 80% profit margin, we obviously need a much lower conversion rate than someone who is selling a $50 DVD with a 70% profit margin.

For sophisticated tools and free spreadsheets that do all sorts of calculations for you, visit the reader-only resources at www.fourhourblog.com.

Johanna and Sherwood decide to keep it simple at this stage: How much did they spend on PPC ads and how much did they "sell"?

Johanna has done well. The traffic wasn't enough to make the test stand up to statistical scrutiny, but she spent about $200 on PPC and got 14 sign-ups for a free 10-tip report. If she assumes 60% would purchase, that means 8.4 people **x** $75 profit per DVD = $630 in hypothetical total profit. This is also not taking into account the potential lifetime value of each customer.

The results of her small test are no guarantee of future success, but the indications are positive enough that she decides to set up a Yahoo Store for $99 per month and a small per-transaction fee. Her credit isn't excellent, so she will opt to use www.paypal.com to accept credit cards online instead of approaching her bank for a merchant account.[46] She e-mails the 10-tip report to those who signed up and asks for their feedback and recommendations for content on the DVD. Ten days later, she has a first attempt at the DVD ready to ship and her store is online. Her sales to the original sign-ups cover costs of production and she is soon selling a respectable 10 DVDs per week ($750 profit) via Google Adwords. She plans to test advertising in niche magazines and blogs and now needs to create an automation architecture to remove herself from the equation.

Sherwood didn't fare as well but still sees potential. He spent $150 on PPC and "sold" three shirts for a hypothetical $225 in profit. He had more than enough traffic, but the bulk of visitors left the site on the pricing page. Rather than drop pricing, he decides to test a "2x money-back guarantee" on the pricing page, which will enable customers to get a $200 refund if the $100 shirts aren't the "most comfortable they've ever owned." He retests and "sells" seven shirts for $525 in profit. Based on these results, he sets up a merchant account through his bank and Authorize.net to process credit cards, orders a dozen shirts from France, and sells them all over the following ten days. This gives him enough profit to buy a small display ad at 50% off (asking for a "first-time advertiser discount" and then citing a competing magazine to get another 20% off) in a local weekly art magazine, in which he calls the shirt "Jackson Pollock Shirts." He orders two dozen more shirts with net-30 payment terms and puts a toll-free number[47] in the print ad that forwards to his cell phone. He does this instead of using a website for two reasons: (1) He wants to determine the most common questions for his FAQ online, and (2) he wants to test an offer of $100 for one shirt ($75 in profit) or "buy two, get one free" ($200 - $75 = $125 profit).

He sells all 24 shirts in the first five days the magazine runs, most through the special offer. Success. He redesigns the print ad, putting answers to common questions in the text to cut down on calls for information, and decides to negotiate a longer-term ad agreement with the magazine. He sends his sales rep a check for four issues at 30% of their published rates. He calls to confirm that they received his check via FedEx and, with check in hand and deadlines looming, they don't refuse.

Sherwood wants to go to Berlin during a two-week break from his job, which he is now considering quitting. How can he roll out his success and escape his own company? He needs to build the architecture and get his mobile M.B.A.

That's where the next chapter comes in.

New Rich Revisited: How Doug Did It

Remember Doug from ProSoundEffects.com? How did he test the idea and go from $0 to $10,000 per month in the process? He followed these steps.

1. Market Selection

He chose music and television producers as his market because he is a musician himself and has used these products.

2. Product Brainstorm

He chose the most popular products available for resale from the largest manufacturers of sound libraries and arranged a wholesale purchase and drop-ship agreement with them. Many of these libraries cost well above $300 (up to $7,500), and this is precisely why he needs to answer more customer-service questions than someone with a lower-priced product of $50–200.

3. Micro-Testing

He auctioned the products on eBay to test demand (and the highest possible pricing) before purchasing inventory. He ordered product only when people placed orders from him, and product shipped immediately from the manufacturers' warehouses. Based on this demand confirmed on eBay, Doug created a Yahoo Store with these products and began testing Google Adwords and other PPC search engines.

4. Rollout and Automation

Following this testing, and upon generating sufficient cash flow, Doug began experimenting with print advertising in trade magazines. Simultaneously, he streamlined and outsourced operations to reduce his time requirements from two hours per day to two hours per week.

► COMFORT CHALLENGE

Rejecting First Offers and Walking Away (3 Days)

Before performing this exercise, if possible, read the bonus chapter "How to Get $700,000 of Advertising for $10,000" on our companion site, and then set aside two hours on a consecutive Saturday, Sunday, and Monday.

On Saturday and Sunday, go to a farmers' market or other outdoor event where goods are sold. If this isn't possible, go to small independent retailers (not chains or mass retail).

Set a budget of $100 for your negotiating tuition and look for items to purchase that total at least $150. Your job is to get the sellers down to a total of $100 or less for the lot. It is better to practice on many cheap items rather than a few big items. Be sure to reply to their first offer with, "What type of discount can you offer?" to let them negotiate against themselves. Negotiate near closing time, choose your objective price, bracket, and make a firm offer with cash in hand for that amount.[48] Practice walking away if your objective price isn't met. On Monday, call two magazines (expect the first to be awkward) and use the script on the companion site to negotiate, minus the last firm offer. Get them as low as possible and then call them back later to indicate that your proposal was refused by upper management or otherwise vetoed.

This is the negotiating equivalent of paper trading.[49] Get used to refusing offers and countering in person and—most importantly—on the phone.

Sample Muse Test Page

► The PX Method (www.pxmethod.com)

This sales template was used to determine the viability of a speed-reading product, which tested successfully. Notice how testimonials, credibility indicators, and risk-reversal guarantees are used, as well as how the pricing is put on a separate page so it can be isolated as a testing variable. Use this as a reference—it is a simple and effective model that can be copied. Please do not input your credit card information, as it is just a mock-up for teaching purposes.

Fast and Simple Website Creation for Non-Techies (and Techies)

► Weebly (www.weebly.com)

Weebly, which the BBC labeled "a must," allowed me to create www.timothyferriss.com in less than two hours and have it appear on the front page of Google for "timothy ferriss" searches within 48 hours. It is, like WordPress.com below, designed to be very SEO-friendly (search-engine optimization) without any knowledge or action on your part. No HTML or Internet expertise is required.

► WordPress.com (www.wordpress.com)

I used WordPress.com to set up www.litliberation.org from a coffee shop in Bratislava, Slovakia, when a U.S.-based designer flaked out and left me scrambling. It took me less than three hours to learn how to use it and build the site. The site, an experimental educational fundraiser, ended up raising 200%+ more than Stephen Colbert in the same period of time. I also use their free open-sourced version of WordPress (www.wordpress.org, which requires separate hosting) to manage everything for my top-1,000 blog at www.fourhourblog.com. This offers greater customization but requires more management and technical know-how.

Both Weebly and WordPress.com host your site for you, so additional hosting setup isn't required.

If you choose to use www.wordpress.org (not.com) for greater customizability, I suggest using a hosting service with one-click WordPress installation like www.bluehost.com. The Shopp plug-in (http://shopplugin.net/) or Market Theme plug-in (http://www.markettheme.com/) can then be used to add e-commerce capabilities. Shopify.com (discussed later) is another good all-in-one alternative.

Create Forms in Seconds for Testing Checkout with or Without Payment

► Wufoo (www.wufoo.com)

Wufoo does not offer a full-featured shopping cart, but it provides the cleanest, easiest-to-use forms on

the web. Create a checkout page that connects to PayPal and you can (1) link to this checkout page from your site on Weebly, WordPress.com, or elsewhere, or (2) drop the code into your own website and have it hosted there. Wufoo is appropriate for testing and selling single products, as people can't add multiple items to a shopping cart or otherwise customize the order à la Amazon. For those additional options, which are often desirable after successful testing, you will want to use an "end-to-end site solutions" listed later in these resources.

Cost-Effective Trademark Filing and Company Formation (LLC, C-Corp, etc.)

Though I also have a C-Corporation (often used to issue common and preferred stock to investors), created through the second option below, LLCs and S-Corps are generally favored by small businesses. Consult your accountant to determine the best entity form.

► **LegalZoom (www.legalzoom.com)**

Company formation, trademarks, and nearly all legal documents. I know one founder who used this service to incorporate his tech start-up, which is now worth more than $200 million.

► **Corporate Creations (www.corporatecreations.com)**

Domestic and overseas company formation.

Services for Selling Downloadable Products (e-books, videos, audio, etc., in descending order of reader preference)

► **E-Junkie (www.e-junkie.com)**

► **Lulu (www.lulu.com)**

Lulu will also do print-on-demand and other forms of manufacture and fulfillment. Like Lightning Source (www.lightningsource.com), it offers distribution through Amazon, Barnes & Noble online, and other major outlets.

► **CreateSpace (www.createspace.com)**

A subsidiary of Amazon.com that offers inventory-free, physical distribution of books, CD and DVDs on Demand, as well as video downloads through Amazon Video On Demand(tm).

► **Clickbank (www.clickbank.com)**

Provides integrated access to affiliates willing to sell your product for a percentage of sales.

Introduction to Pay-Per-Click (PPC) Advertising and Testing

► **Google Adwords (www.google.com/adwords)**

Market Sizing and Keyword Suggestion Tools

Brainstorm additional PPC search terms and determine the number of people who are searching for them.

► **Google Adwords Keyword Tool (http://adwords.google.com/select/KeywordToolExternal)**

Enter the potential search terms to find search volume and alternative terms with more search traffic. Click on the "Approx Avg Search Volume" column to sort results from most to least searched.

► **SEOBook Keyword Tool, SEO for Firefox Extension (http://tools.seobook.com /)**

Outstanding resource page with searches powered by Wordtracker (www.wordtracker.com).

Low-Cost Domain Registration

- ► **Domains in Seconds (www.domainsinseconds.com)** I have registered more than 100 domains through this service.
- ► **Joker (www.joker.com)**
- ► **GoDaddy (www.godaddy.com)**

Inexpensive but Dependable Hosting Services

Shared hosting solutions, where your site is hosted alongside other sites on a single server, are so cheap that I recommend using two providers, one as a primary and one as a backup. Put your site pages on each host and sign up with www.no-ip.com, which can redirect traffic (DNS) to the backup in five minutes instead of the usual 24 to 48 hours.

- ► **1and1 (www.1and1.com)**

- ► **BlueHost (www.bluehost.com)**
- ► **RackSpace (www.rackspace.com ;** known for dedicated and managed servers)
- ► **Hosting.com (www.hosting.com ;** known for dedicated and managed servers)

Royalty-Free Photos and Materials

► **iStockphoto (www.istockphoto.com)**

iStockphoto is the Internet's original member-generated image and design site, which has more than 4 million photographs, vector illustrations, videos, audio tracks, and Flash files available for use.

► **Getty Images (www.gettyimages.com)**

This is where the pros go. Stock photos and film of anything for a price. I pay $150–400 for most images I use in national print campaigns and the quality is outstanding.

E-mail Sign-up Tracking and Scheduled Autoresponders

Both of these programs can be used to embed e-mail address sign-up forms on your site.

- ► **AWeber (www.aweber.com)**
- ► **MailChimp (www.mailchimp.com)**

End-to-End Site Solutions with Payment Processing

► **Shopify (www.shopify.com)**

This is a reader favorite that, in addition to beautiful design, offers full SEO (search-engine optimization), drag-and-drop use, statistics, and product fulfillment through one of their certified partners such as Fulfillment by Amazon.com. Clients range from small-business owners to Tesla Motors. Unlike with Yahoo and eBay, however, you will need to set up a payment-processing service to accept payments from customers. (See below—PayPal is the easiest to integrate.)

► **Yahoo! Store (http://smallbusiness.yahoo.com/ecommerce) (866–781–9246)**

This is what Doug of Pro Sound Effects used. As little as $40 a month with 1.5% per transaction.

► **eBay Store (http://pages.ebay.com/storefronts/start.html)**

From $15–500 per month, plus eBay fees.

Simple Payment Processing for Testing Pages, from Least to Most Involved

►**PayPal Cart (www.paypal.com;** see "merchant")

Accept credit card payments in minutes. No monthly fees, 1.9–2.9% of each transaction (called "discount rate") and $0.30 per transaction.

► **Google Checkout (http://checkout.google.com/sell)**

Get $10 in free processing for each $1 spent on AdWords; 2% and $0.20 per transaction thereafter. Requires that customers have a Google ID, and is thus most useful as a supplement to one of the aforementioned payment solutions. Be sure to link your Checkout account to your AdWords account to receive credit. Important note: free transaction processing for nonprofits.

► **Authorize.net (www.authorize.net)**

The Authorize.Net Payment Gateway can help you accept credit card and electronic check payments quickly and affordably. More than 230,000 merchants trust Authorize.net to manage their transactions, help prevent fraud, and grow their business. The fees per transaction are lower than PayPal or Google Checkout, but setup will require a merchant account, covered in the next chapter, and other time-consuming applications. I suggest setting up Authorize.net only after a product has tested successfully through one of the other two options above.

Software for Understanding Web Traffic (Web Analytics)

How are people finding, browsing, and leaving your site? How many prospective customers are being delivered by each PPC ad, and which pages are most popular? These programs tell you all this and more. Google is free for most low-volume sites—and better than a lot of paid software-and the others cost $30 and upward per month.

► **Google Analytics (www.google.com/analytics)**

► **CrazyEgg (www.crazyegg.com)**

I use CrazyEgg to see exactly where people are clicking most and least on homepages and landing pages. It is particularly helpful for repositioning the most important links or buttons to help prompt visitors to take specific next actions. Don't guess what's working or not—measure it.

►**Clicktracks (www.clicktracks.com)**

► **WebTrends (www.webtrends.com)**

A/B Testing Software

Testing is, as you know, the name of the game, but testing all the variables can be confusing. How do you know which combination of headlines, text, and images on your homepage results in the most sales? Instead of using one version for a bit, then alternating, which is time-consuming, use software that serves up different versions to prospects at random, then does the math for you.

► **Google Website Optimizer (WO) (http://www.google.com/websiteoptimizer)**

This is a free tool that, like Google Analytics, is better than most paid services. I used Google WO to test three potential homepages for www.dailyburn.com and increased sign-ups 19%, then again by more than 16%.

- ► **Offermatica (www.offermatica.com)**
- ► Vertster.com (www.vertster.com)
- ► Optimost (www.optimost.com)

Low-Cost Toll-free Numbers

►**TollFreeMAX (www.tollfreemax.com) (877–888–8MAX)** and **Kall8 (www.kall8.com)**

TollFreeMAX and Kall8 both allow you to set up toll-free numbers in 2–5 minutes. Calls can then be forwarded to any other numbers, and voicemail and statistics can be managed online or via e-mail.

Checking Competitive Site Traffic

Want to see how much traffic your competition is getting and who is linking to them?

- ► **Compete (www.compete.com)**
- ► **Quantcast (www.quantcast.com)**
- ► **Alexa (www.alexa.com)**

Freelance Designers and Programmers

►**99Designs (www.99designs.com)** and **Crowdspring (www.crowdspring.com)**

I used 99Designs to get an excellent logo for www.litliberation.org in 24 hours for less than $150. I submitted the concept, more than 50 designers worldwide uploaded their best attempts, which I could browse, and I chose the best after suggesting a few improvements. From Crowdspring's site: "Name your price, name your deadline, see entries within hours and be done in just days. The average project gets a whopping 68 entries. 25 entries or your money back."

- ► **eLance (www.elance.com) (877–435–2623)**

- ► **Craigslist (www.craigslist.org)**

► LIFESTYLE DESIGN IN ACTION

I'm a U.S. citizen and it was impossible for my friends and relatives to track me down by phone. Enter Skype In. It's not new but allows you to lease a fixed U.S. (or other country) phone number which then forwards to your Skype account. About $60/year. Within Skype you can then set up call forwarding to ring you at your local number. You pay the rate as if you were calling from the United States to wherever you are. I've used this in about 40 countries and it works like a treat. The call quality is usually great and the convenience is amazing. http://www.skype.com/allfeatures/onlinenumber/. A caveat is to always, ALWAYS get a local SIM card for your unlocked GSM phone. Roaming is for amateurs. A local SIM also gets you GPRS, Edge, or 3G. Sometimes even free Wifi. Cheers, ***—TY KROLL***

• • •

Basically I try to keep all of my tools online so that if my laptop gets stolen, I can buy a new one and have everything up and running within 24 hours. Here are a few of the tools I use on a regular basis:

- RememberTheMilk.com has been really crucial to me keeping on top of my daily tasks.
- Freshbooks.com for online invoicing
- Highrise (http://www.highrisehq.com/) for online CRM
- Dropbox (getdropbox.com) for easy file sharing/automatic backup of critical files while on the road
- TrueCrypt (truecrypt.org) for keeping your laptop data secure while on the road. *[Tim comment: This can also be used with a USB flash drive, and another cool feature—it provides two levels of "plausible deniability" (hidden volumes, etc.) if someone forces you to reveal the password.]*
- PBwiki.com-Wiki site that helps me keep on top of the notes and ideas that I collect as I go through life.
- FogBugz on Demand: http://www.fogcreek.com/FogBUGZ/IntrotoOnDemand.html. It's a "bug tracker" aimed at software development companies, but I use it every day for both personal and business tasks. It's almost like a VA, as you can route your mail through it and it will help you sort it and keep track of it. It has great features to track e-mails, and there's a free version for two users (me + VA!). ***—RB CARTER***

• • •

A really useful service is Amazon's Mechanical Turk. With a small investment in time or money, a business that requires hundreds of people doing small bits of defined work becomes possible for extraordinarily low work-per-unit costs. Examples include the search for Steve Fosset (literally thousands of people looked at satellite photos that would have overwhelmed SAR agencies) and a trouble-ticket business that utilizes qualified labor all over the world (see Amazon.com/webservices). I am not an owner nor do I have any stake in Amazon—but I have used their services and some are trans forming when it comes to muse creation. Cheers, ***—J MARYMEE***

• • •

FAST TO MARKET

The fastest way to market with a product idea is: Registera.com. Get hosting from dathorn.com [a cheap reseller account, like www.domainsinseconds.com]. With two clicks set up a wordpress blog. Apply a theme to it. Add your content and a buy now button. The buy now button links to an enter e-mail address, phone number, etc., page. The user then clicks a continue to PayPal button. This automatically e-mails me their details, but then shows the user a message stating that the link to PayPal is currently not working. I use this to determine how many sales I would have achieved. I use Google ads to drive traffic … I calculate theoretical ROI (ideally using Google analytics). If after a week or two I can see a positive ROI that's worth my effort I create or outsource the creation of the product (emag, PDF, whatever). I set it all up with a working link to PayPal, and then retrospectively send a message to the users who already tried to buy. Normally within hours I've got all my money back, and the cash starts to roll. An example is the DIY public relations pack at www.mybusinesspr.com.au. Great work of the 4HWW … looking forward to the next edition. Regards, ***MATT SCHMIDT***

39. http://news.com.com/2100–1017–269594.html?legacy=cnet.

40. It can be illegal to charge customers prior to shipment—so we will not charge customers—but it is still common practice. Why do so many commercials state "allow three to four weeks for delivery" if it only takes three to five days for a shipment to get from New York to California? It gives the companies time to manufacture product and use customers' credit card payments to finance it. Clever but often against the law.

41. This applies to Sherwood and not Johanna.

42. How did I come up with the most successful BodyQUICK headline ("The Fastest Way to Increase Power and Speed Guaranteed")? I borrowed it from the longest-running, and thus most profitable, Rosetta Stone headline: "The Fastest Way to Learn a Language Guaranteed.(tm)" Reinventing the wheel is expensive—become an astute observer of what is already working and adapt it. I keep a folder of all print and direct mail advertising that compels me to call a number or visit a website, and I use www.delicious.com to bookmark websites that convince me to provide my e-mail address or make a purchase.

43. Sherwood includes shipping and handling prior to the final order page so that people don't finalize the order just to confirm total pricing. He wants his "orders" to reflect real orders and not price checkers.

44. If you are rolling out after a successful test or building a large e-mail database, tools like www.aweber.com in the resources are better at scaling.

45. Keeping in mind that 100 specific terms at $0.10 per click will perform better than 10 broad terms

at $1.00 per click, the more you spend, and thus the more traffic you drive, the more statistically valid the results will be. If budget permits, increase the number of related terms and daily expenditure so that the entire PPC test costs $500–1,000.

46. This is a checking account for receiving credit card payments.

47. Set this up using services detailed at the end of this chapter and the next.

48. See the online bonus chapter on www.fourhourblog.com to understand all of these terms in context. Search "Jedi Mind Tricks."

49. "Paper trading" refers to setting an imaginary budget, "purchasing" stocks (writing their current values on a piece of paper), and then tracking their performance over time to see how your investment would have done had it been for real. It is a no-risk method for honing investment skills before putting skin in the game.

11
Income Autopilot III

► MBA—MANAGEMENT BY ABSENCE

> The factory of the future will have only two employees, a man and a dog. The man will be there to feed the dog. The dog will be there to keep the man from touching the equipment.
>
> —WARREN G. BENNIS, University of Southern California Professor of Business Administration; adviser to Ronald Reagan and John F. Kennedy

Most entrepreneurs don't start out with automation as a goal. This leaves them open to mass confusion in a world where each business guru contradicts the next. Consider the following:

> A company is stronger if it is bound by love rather than by fear.... If the employees come first, then they're happy.
>
> —HERB KELLEHER, cofounder of Southwest Airlines

> Look, kiddie. I built this business by being a bastard. I run it by being a bastard. I'll always be a bastard, and don't you ever try to change me.[50]
>
> —CHARLES REVSON, founder of Revlon, to a senior executive within his company

Hmm ... Whom to follow? If you are fast on your feet, you'll notice that I just offered you an either-or option. The good news is that, as usual, there is a third option.

The contradictory advice you find in business books and elsewhere usually relates to managing

employees—how to handle the human element. Herb tells you to give them a hug, Revson tells you to kick them in the balls, and I tell you to solve the problem by eliminating it altogether: Remove the human element.

Once you have a product that sells, it's time to design a self-correcting business architecture that runs itself.

The Remote-Control CEO

> The power of hiding ourselves from one another is mercifully given, for men are wild beasts, and would devour one another but for this protection.
>
> —HENRY WARD BEECHER, U.S. abolitionist and clergyman, "Proverbs from Plymouth Pulpit"

RURAL PENNSYLVANIA

In a 200-year-old stone farmhouse, a quiet "experiment in 21st-century leadership" is proceeding exactly as planned.[51] Stephen McDonnell is upstairs in his flip-flops looking at a spreadsheet on his computer. His company has increased its annual revenue 30% per year since it all began, and he is able to spend more time with his three daughters than he ever thought possible.

The experiment? As CEO of Applegate Farms, he insists on spending just one day per week at the company headquarters in Bridgewater, New Jersey. He's not the only CEO who spends time at home, of course—there are hundreds who have heart attacks or nervous breakdowns and need time to recover—but there is a huge difference. McDonnell has been doing it for more than 17 years. Rarer still, he started doing it just six months after founding the company.

This intentional absence has enabled him to create a process-driven instead of founder-driven business. Limiting contact with managers forces the entrepreneur to develop operational rules that enable others to deal with problems themselves instead of calling for help.

This isn't just for small operations. Applegate Farms sells more than 120 organic and natural meat products to high-end retailers and generates more than $35 million in revenue per year.

It is all possible because McDonnell started with the end in mind.

Behind the Scenes: The Muse Architecture

> Orders are nobody can see the Great Oz! Not nobody, not nohow!
>
> —GUARDIAN OF THE EMERALD CITY GATES, *The Wizard of Oz*

Starting with the end in mind—an organizational map of what the eventual business will look like—is not new.

Infamous deal-maker Wayne Huizenga copied the org chart of McDonald's to turn Blockbuster into a billion-dollar behemoth, and dozens of titans have done much the same. In our case, it's the "end in mind" that is different. Our goal isn't to create a business that is as large as possible, but rather a

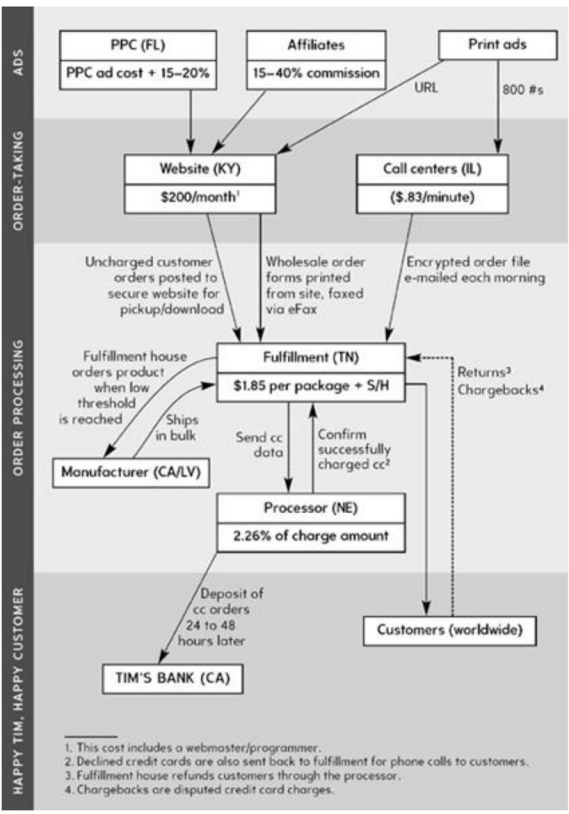
business that bothers us as little as possible. The architecture has to place us out of the information flow instead of putting us at the top of it.

I didn't get this right the first time I tried.

In 2003, I was interviewed in my home office for a documentary called *As Seen on TV*. We were interrupted every 20–30 seconds with beeping e-mail notifications, IM pings, and ringing phones. I couldn't leave them unanswered, because dozens of decisions depended on me. If I didn't ensure the trains were running on time and put out the fires, no one would.

The Anatomy of Automation

THE 4-HOUR WORKWEEK VIRTUAL ARCHITECTURE



Splitting the Pie: Outsourcer Economics

Each outsourcer takes a piece of the revenue pie. Here is what the general profit-loss might look like for a hypothetical $80 product sold via phone and developed with the help of an expert, who is paid a royalty. I recommend calculating profit margins using higher-than-anticipated expenses. This will account for unforeseen costs (read: screwups) and miscellaneous fees such as monthly reports, etc.

REVENUE	
Product cost	$80.00
Shipping/Handling	$12.95
Total Revenue	**$92.95**
EXPENSES	
Product manufacturing	$10.00
Call center ($0.83 per minute × average call time of 4 minutes)	$3.32
Shipping	$5.80
Fulfillment ($1.85 per package + $0.50 for boxes/packing)	$2.35
Credit card processing (2.75% of $92.95)	$2.56
Returns + declined cards (6% of $92.95)	$5.58
Royalties (5% of wholesale price of $48 [$80 × .6])	$2.40
Total expenses	**$32.01**
PROFIT (revenue minus expenses)	**$60.94**

How do you factor in advertising cost? If a $1,000 ad or $1,000 in PPC produces 50 sales, my advertising cost per order (CPO) is $20. *This makes the actual' per-unit profit **$40.94**.*

I set a new goal after that experience, and when I was interviewed six months later as a follow-up, one change was more pronounced than all others: silence. I had redesigned the business from the ground up so that I had no phone calls to answer and no e-mail to respond to.

I'm often asked how big my company is—how many people I employ full-time. The answer is one. Most people lose interest at that point. If someone were to ask me how many people run Brain-QUICKEN LLC, on the other hand, the answer is different: between 200 and 300. I am the ghost in the machine.[52]

From advertisements—print in this example—to a cash deposit in my bank account, the diagram is what a simplified version of my architecture looks like, including some sample costs. If you have developed a product based on the guidelines in the last two chapters, it will plug into this structure hand-in-glove.

Where am I in the diagram? Nowhere.

I am not a tollbooth through which anything needs to pass. I am more like a police officer on the side of the road who can step in if need be, and I use detailed reports from outsourcers to ensure the cogs are moving as intended. I check reports from fulfillment each Monday and monthly reports from the same the first of each month. The latter reports include orders received from the call center, which I can compare to the call center bills to gauge profit. Otherwise, I just check bank accounts online on the first and fifteenth of each month to look for odd deductions. If I find something, one e-mail will fix it, and if not, it's back to kendo, painting, hiking, or whatever I happen to be doing at the time.

Removing Yourself from the Equation: When and How

The system is the solution.

—AT&T

The diagram should be your rough blueprint for designing a self-sustaining virtual architecture. There could be differences—more or fewer elements—but the main principles are the same:

1. Contract outsourcing companies[53] that specialize in one function vs. freelancers whenever possible so that if someone is fired, quits, or doesn't perform, you can replace them without interrupting your business. Hire trained groups of people who can provide detailed reporting and replace one another as needed.

2. Ensure that all outsourcers are willing to communicate among themselves to solve problems, and *give them written permission to make most inexpensive decisions without consulting you first* (I started at less than $100 and moved to $400 after two months).

How do you get there? It helps to look at where entrepreneurs typically lose their momentum and stall permanently.

Most entrepreneurs begin with the cheapest tools available, bootstrapping and doing things themselves to get up and running with little cash. This isn't the problem. In fact, it's necessary so that the entrepreneurs can train outsourcers later. The problem is that these same entrepreneurs don't know when and how to replace themselves or their homemade infrastructure with something more **scalable**.

By "scalable," I mean a business architecture that can handle 10,000 orders per week as easily as it can handle 10 orders per week. Doing this requires minimizing your decision-making responsibilities, which achieves our goal of time freedom while setting the stage for doubling and tripling income with no change in hours worked.

Call the companies at the end of the chapter to research costs. Plan and budget accordingly to upgrade infrastructure at the following milestones, which I measure in units of product shipped:

Phase I: 0–50 Total Units of Product Shipped

Do it all yourself. Put your phone number on the site for both general questions and order-taking—this is important in the beginning—and take customer calls to determine common questions that you will answer later in an online FAQ. This FAQ will also be the main material for training phone operators and developing sales scripts.

Is PPC, an offline advertisement, or your website too vague or misleading, thus attracting unqualified and time-consuming consumers? If so, change them to answer common questions and make the product benefits (including what it isn't or doesn't do) clearer.

Answer all e-mail and save your responses in one folder called "customer service questions." CC yourself on responses and put the nature of the customers' questions in the subject lines for future indexing. Personally pack and ship all product to determine the cheapest options for both. Investigate opening a merchant account from your local small bank (easier to get than with a larger bank) for later outsourced credit card processing at higher roll-out volumes.

Phase II: >10 Units Shipped Per Week

Add the extensive FAQ to your website and continue to add answers to common questions as received. Find local fulfillment companies in the yellow pages under "fulfillment services" or "mailing services." If you cannot find one there or at www.mfsanet.org, call local printers and ask them for recommendations. Narrow the field to those (often the smallest) who will agree not to charge you setup fees and monthly minimums. If this isn't possible, ask for at least 50% off both and then request that the setup fee be applied as an advance against shipping or their other fees.

Limit the candidates further to those who can respond to order status e-mail (ideal) or phone calls from customers. The e-mail from your "customer service" folder will be provided as copy-and-paste responses, especially those related to order status and refund requests.[54]

To lower or eliminate miscellaneous fees, explain that you are a start-up and that your budget is small. Tell them you need the cash for advertising that will drive more shipments. If needed, mention the competitive companies that you are considering and pit them against one another, using lower pricing or concessions from one to get larger discounts and bonuses from the others.

Before making your final selection, ask for at least three client references and use the following to elicit the negatives: "I understand they're good, but everyone has weaknesses. If you had to point out where you've had some issues and what they're not the best at, what would you say? Can you please describe an incident or a disagreement? I expect these with all companies, so it's no big deal, and it's confidential, of course."

Ask for "net-30 terms"—payment for services 30 days after they're rendered—after one month of prompt payment for their services. It is easier to negotiate all of the above points with smaller operations that need the business. Have your contract manufacturer ship product directly to the fulfillment house once you have decided on one and put the fulfillment house's e-mail (you can use an e-mail address at your domain and forward it) or phone number on the online "thank you" page for order status questions.

Phase III: >20 Units Shipped Per Week

Now you will have the cash flow to afford the setup fees and the monthly minimums that bigger, more sophisticated outsourcers will ask for. Call the end-to-end fulfillment houses that handle it all—from order status to returns and refunds. Interview them about costs and ask them for referrals to call centers and credit card processors they've collaborated with for file transfers and problem solving. Don't assemble an architecture of strangers—there will be programming costs and mistakes, both of which are expensive.

Set up an account with the credit card processor first, for which you will need your own merchant account. This is critical, as the fulfillment house can only handle refunds and declined cards for transactions they process themselves through an outsourced credit card processor.

Optionally, set up an account with one of the call centers your new fulfillment center recommends. These will often have toll-free numbers you can use instead of purchasing your own. Look at the percentage split of online to phone orders during testing and consider carefully if the extra revenue from the latter is worth the hassle. It often isn't. Those who call to order will generally order online if given no other option.

Before signing on with a call center, get several 800 numbers they answer for current clients and make test calls, asking difficult product-related questions and gauging sales abilities. Call each number at least three times (morning, afternoon, and evening) and note the make-or-break factor: wait time. The phone should be answered within three to four rings, and if you are put on hold, the shorter the wait the better. More than 15 seconds will result in too many abandoned calls and waste advertising dollars.

The Art of Undecision: Fewer Options = More Revenue

Companies go out of business when they make the wrong decisions or, just as important, make too many decisions. The latter creates complexity.

—MIKE MAPLES, cofounder of Motive Communications (IPO to $260 million market cap), founding executive of Tivoli (sold to IBM for $750 million), and investor in companies such as Digg.com

Joseph Sugarman is the marketing genius behind dozens of direct-response and retail successes, including the BluBlocker sunglasses phenomenon. Prior to his string of home runs on television (he sold 20,000 pairs of BluBlockers within 15 minutes of his first QVC appearance), his domain was print media, where he made millions and built an empire called JS&A Group. He was once recruited to design an advertisement for a manufacturer's watch line. The manufacturer wanted to feature nine different watches in the ad, and Joe recommended featuring just one. The client insisted and Joe offered to do both and test them in the same issue *of The Wall Street Journal*. The result? The one-watch offer outsold the nine-watch offer 6-to-1.[55]

Henry Ford once said, referring to his Model-T, the bestselling car of all time,[56] "The customer can have any color he wants, so long as it's black." He understood something that businesspeople seem to have forgotten: Serving the customer ("customer service") is not becoming a personal concierge and catering to their every whim and want. Customer service is providing an excellent product at an acceptable price and solving legitimate problems (lost packages, replacements, refunds, etc.) in the fastest manner possible. That's it.

The more options you offer the customer, the more indecision you create and the fewer orders you receive—it is a disservice all around. Furthermore, the more options you offer the customer, the more manufacturing and customer service burden you create for yourself.

The art of "undecision" refers to minimizing the number of decisions your customers can or need to make. Here are a few methods that I and other **NR** have used to reduce service overhead 20–80%:

1. Offer one or two purchase options ("basic" and "premium," for example) and no more.
2. Do not offer multiple shipping options. Offer one fast method instead and charge a premium.
3. Do not offer overnight or expedited shipping *(it is possible to refer them to a reseller who does, as is true with all of these points)*, as these shipping methods will produce hundreds of anxious phone calls.
4. Eliminate phone orders completely and direct all prospects to online ordering. This seems outrageous until you realize that success stories like Amazon.com have depended on it as a fundamental cost-saver to survive and thrive.
5. Do not offer international shipments. Spending 10 minutes per order filling out customs forms and then dealing with customer complaints when the product costs 20–100% more with tariffs and duties is about as fun as headbutting a curb. It's about as profitable, too.

Some of these policies hint at what is perhaps the biggest time-saver of all: customer filtering.

Not All Customers Are Created Equal

Once you reach Phase III and have some cash flow, it's time to re-evaluate your customers and thin the herd. There are good and bad versions of all things: good food, bad food; good movies, bad movies; good sex, bad sex; and, yes, good customers and bad customers.

Decide now to do business with the former and avoid the latter. I recommend looking at the customer as an equal trading partner and not as an infallible blessing of a human being to be pleased at all costs. If you offer an excellent product at an acceptable price, it is an equal trade and not a begging session between subordinate (you) and superior (customer). Be professional but never kowtow to unreasonable people.

Instead of dealing with problem customers, I recommend you prevent them from ordering in the first place.

I know dozens of **NR** who don't accept Western Union or checks as payment. Some would respond to this with, "You're giving up 10–15% of your sales!" The **NR**, in turn, would say, "I am, but I'm also avoiding the 10–15% of the customers who create 40% of the expenses and eat 40% of my time." It's classic 80/20.

Those who spend the least and ask for the most before ordering will do the same after the sale. Cutting them out is both a good lifestyle decision and a good financial decision. Low-profit and high-maintenance customers like to call operators and spend up to 30 minutes on the phone asking questions that are unimportant or answered online, costing—in my case—$24.90 (30 **x** $0.83) per 30-minute incident, eliminating the minuscule profit they contribute in the first place.

Those who spend the most complain the least. In addition to our premium $50–200 pricing, here are a few additional policies that attract the high-profit and low-maintenance customers we want:

1. Do not accept payment via Western Union, checks, or money order.
2. Raise wholesale minimums to 12–100 units and require a tax ID number to qualify resellers who are real businesspeople and not time-intensive novices. Don't run a personal business school.
3. Refer all potential resellers to an online order form that must be printed, filled out, and faxed in. Never negotiate pricing or approve lower pricing for higher-volume orders. Cite "company policy" due to having had problems in the past.
4. Offer low-priced products (à la MRI's NO2 book) instead of free products to capture contact information for follow-up sales. Offering something for free is the best way to attract time-eaters and spend money on those unwilling to return the favor.
5. Offer a **lose-win guarantee** (see boxed text) instead of free trials.
6. Do not accept orders from common mail fraud countries such as Nigeria.

Make your customer base an exclusive club, and treat the members well once they've been accepted.

The Lose-Win Guarantee—How to Sell Anything to Anyone

If you want a guarantee, buy a toaster.

—CLINT EASTWOOD

The 30-day money-back guarantee is dead. It just doesn't have the pizzazz it once did. If a product doesn't work, I've been lied to and will have to spend an afternoon at the post office to return it. This

costs me more than just the price I paid for the product, both in time and actual postage. Risk elimination just isn't enough.

This is where we enter the neglected realm of **lose-win** guarantees and risk reversal. The **NR** use what most consider an afterthought—the guarantee—as a cornerstone sales tool.

The **NR** aim to make it profitable for the customer even if the product fails. Lose-win guarantees not only remove risk for the consumer but put the company at financial risk.

Here are a few examples of putting your money where your mouth is.

Delivered in 30 minutes or less or it's free!
(Domino's Pizza built its business on this guarantee.)

We're so confident you'll like CIALIS, if you don't we'll pay for the brand of your choice.
(The "CIALIS® Promise Program" offers a free sample of CIALIS and then offers to pay for competing products if CIALIS doesn't live up to the hype.)

If your car is stolen, we'll pay $500 of your insurance deductible.
(This guarantee helped THE CLUB become the #1-selling mechanical automobile anti-theft device in the world.)

110% guaranteed to work within 60 minutes of the first dose.
(This was for BodyQUICK and a first among sports nutrition products. I offered to not only refund customers the price of the product if it didn't work within 60 minutes of the *first dose*, but also to send them a check for 10% more.)

The lose-win guarantee might seem like a big risk, especially when someone can abuse it for profit like in the BodyQUICK example, but it isn't … *if* your product delivers. Most people are honest.

Let's look at some actual numbers.

Returns for BodyQUICK, even with a 60-day return period (and partially because of it[57]), are less than 3% in an industry in which the average is 12–15% for a normal 30-day 100% money-back guarantee. Sales increased more than 300% within four weeks of introducing the 110% guarantee, and returns decreased overall.

Johanna adopted this lose-win offer and came up with "Increase sport-specific flexibility 40% in two weeks or return it for a full refund (including shipping) and keep the 20-minute bonus DVD as our gift."

Sherwood found his guarantee as well: "If these shirts are not the most comfortable you've ever worn, return them and get 2-times your purchase price back. Each shirt is also guaranteed for life—if it gets threadbare, send it back and we'll replace it free of charge."

Both of them increased sales more than 200% in the first two months. Return percentage remained the same for Johanna and increased 50% for Sherwood, from 2 to 3%. Disaster? Far from it. Instead of selling 50 and getting one back with a 100% guarantee [(50 **x** $100) – $100 = $4,900 in revenue], he sold 200 and got six back with the 200% guarantee [(200 **x** $100) – (6 **x** $200) = $18,800 in revenue]. I'll take the latter.

Lose-win is the new win-win. Stand out and reap the rewards.

Little Blue Chip: How to Look Fortune 500 in 45 Minutes

Are you tired of sand being kicked in your face? I promise you new muscles in days!

—CHARLES ATLAS, strongman who sold more than $30 million worth of "dynamic-tension" muscle courses through comic books

If approaching large resellers or potential partners, small company size will be an obstacle. This discrimination is often as insurmountable as it is unfounded. Fortunately, a few simple steps can dramatically upgrade your budding Fortune 500 image and take your muse from coffee shop to boardroom in 45 minutes or less.

1. Don't be the CEO or founder.
Being the "CEO" or "Founder" screams start-up. Give yourself the mid-level title of "vice president" (VP), "director," or something similar that can be added to depending on the occasion (Director of Sales, Director of Business Development, etc.). For negotiation purposes as well, remember that it is best *not* to appear to be the ultimate decision-maker.

2. Put multiple e-mail and phone contacts on the website.
Put various e-mail addresses on the "contact us" page for different departments, such as "human resources," "sales," "general inquiries," "wholesale distribution," "media/PR," "investors," "web comments," "order status," and so on. In the beginning, these will all forward to your e-mail address. In Phase III, most will forward to the appropriate outsourcers. Multiple toll-free numbers can be used in the same fashion.

3. Set up an Interactive Voice Response (IVR) remote receptionist.
It is possible to sound like a blue chip for less than $30. In fewer than ten minutes on a site such as www.angel.com, which boasts clients such as Reebok and Kellog's, it is possible to set up an 800 number that greets callers with a voice prompt such as, "Thank you for calling [business name]. Please say the name of the person or department you would like to reach or just hold on for a list of options."

Upon speaking your name or selecting the appropriate department, the caller is forwarded to your preferred phone or the appropriate outsourcer—with on-hold music and all.

4. Do not provide home addresses.
Do not use your home address or you will get visitors. Prior to securing an end-to-end fulfillment house that can handle checks and money orders—if you decide to accept them—use a post office box but leave out the "PO Box" and include the street address of the post office itself. Thus "PO Box 555, Nowhere, US 11936" becomes "Suite 555, 1234 Downtown Ave., US 11936."

Go forth and project professionalism with a well-designed image. *Perceived* size does matter.

► COMFORT CHALLENGE

Relax in Public (2 days)

This is the last Comfort Challenge, placed prior to the chapter that tackles the most uncomfortable turning point for most office dwellers: negotiating remote work agreements. This challenge is intended to

be fun while showing—in no uncertain terms—that the rules most follow are nothing more than social conventions. There are no legal boundaries stopping you from creating an ideal life … or just being self-entertained and causing mass confusion.

So, relaxing in public. Sounds easy, right? I'm somewhat famous for relaxing in style to get a laugh out of friends. Here is the deal, and I don't care if you're male or female, 20 or 60, Mongolian or Martian. I call the following a "time-out."

Once per day for two days, simply lie down in the middle of a crowded public place at some point. Lunchtime is ideal. It can be a well-trafficked sidewalk, the middle of a popular Starbucks, or a popular bar. There is no real technique involved. Just lie down and remain silent on the ground for about ten seconds, and then get up and continue on with whatever you were doing before. I used to do this at nightclubs to clear space for break-dancing circles. No one responded to pleading, but going catatonic on the ground did the trick.

Don't explain it at all. If someone asks about it after the fact (he or she will be too confused to ask you while you're doing it for 10 seconds), just respond, "I just felt like lying down for a second." The less you say, the funnier and more gratifying this will be. Do it on solo missions for the first two days, and then feel free to do it when with a group of friends. It's a riot.

It isn't enough to think outside the box. Thinking is passive. Get used to acting outside the box.

► TOOLS AND TRICKS

Looking Huge—Virtual Receptionist and IVR

► Angel (www.angel.com)

Get an 800 number with professional voice menu (voice recognition departments, extensions, etc.) in five minutes. Incredible.

► Ring Central (www.ringcentral.com)

Offers toll-free numbers, call screening and forwarding, voicemail, fax send and receive, and message alerts, all online.

CD/DVD Duplication, Printing, and Product Packaging

► AVC Corporation (www.avccorp.com)

► SF Video (www.sfvideo.com)

Local Fulfillment (fewer than 20 units shipped per week)

► Mailing Fulfillment Service Association (www.mfsanet.org)

End-to-End Fulfillment Companies (more than 20 units shipped per week, $500+ setup)

► **Motivational Fulfillment (www.mfpsinc.com)**

The secret backend to campaigns from HBO, PBS, Comic Relief, Body by Jake, and more.

► **Innotrac (www.innotrac.com)**

They are currently one of the largest DR marking companies.

► **Moulton Fulfillment (www.moultonfulfillment.com)**

200,000-square-foot facility with real-time online inventory reports.

Call Centers (per-minute and/or per-sale fees)

There are generally two classes of call centers: order takers and commissioned reps. Interview each provider you consider to understand the options and costs involved.

The former is a good option if you give the product price in an advertisement (hard offer), are offering free information (lead generation), or don't need trained salespeople who can overcome objections. In other words, your ad or website is pre-qualifying prospects.

The latter would more appropriately be called "sales centers." Operators are commissioned and trained "closers" whose sole goal is to convert callers to buyers. These calls are often in response to "call for information/ trial/sample" ads that don't feature a price (soft offers). Expect higher costs per sale.

► **LiveOps (www.liveops.com)**

Pioneer in home-based reps, which often ensures more calls are answered. Provides comprehensive service with agents, IVR, and Spanish. Often used for one-step order taking instead of soft offers.

► **West Teleservices (www.west.com)**

29,000 employees worldwide, processes billions of minutes per year. All the high-volume and low-price players use them for lower-priced products or higher-end products with free trials and installment plans.

► **NexRep (www.nexrep.com)**

Highly skilled home-based sales agents that specialize in B2C and B2B, inbound and outbound programs. If performance, speed to respond, Internet integration, and quality customer experience are your priorities, this is a strong option to consider.

► **Triton Technology (www.tritontechnology.com)**

Commission-only sales center know for incredible closing abilities (see the movie *Boiler Room* and Alec Baldwin's character in *Glengarry, Glen Ross)*. Don't call unless your product sells for at least $100.

► **CenterPoint Teleservices (http://www.centerpointllc.com)**

This sales force has experience to convert sales from hard offers, soft offers, and multiple offers (upselling additional products after a caller agrees to purchase the advertised product) originating from radio, TV, print, or the web.

► **Stewart Response Group (www.stewartresponsegroup.com)**

Sales-driven call center leveraging the home-agent model for both inbound and outbound programs. Another high-touch boutique center.

Credit Card Processors (merchant account through your bank necessary)

These companies, unlike options in the last chapter, specialize in not only processing credit cards but interacting with fulfillment on your behalf, removing you from the flowchart.

► **TransFirst Payment Processing (www.transfirst.com)**

► **Chase Paymentech (www.paymentech.com)**

► **Trust Commerce (www.trustcommerce.com)**

► **PowerPay (www.powerpay.biz)**

One of the Inc. 500 Fastest-Growing Private Companies. Process credit cards from your iPhone and more.

Affiliate Program Software

► **My Affiliate Program (www.myaffiliateprogram.com)**

Also see the affiliate programs listed in the "Tools and Tricks" at the end of Chapter 9.

Discount Media Buying Agencies

If you go to a magazine, radio station, or TV channel and pay rate card—the "retail" pricing first given—you will never make it big. To save a lot of headache and expense, consider using ad agencies that

negotiate discounts of up to 90% in their chosen media.

► **Manhattan Media (Print) (www.manhmedia.com)**

Great agency with fast turnaround. I've used them since the beginning.

► **Novus Media (Print) (www.novusprintmedia.com)**

Relationships with 1,400+ magazine and newspaper publishers with an average of 80% of rate card. Clients include Sharper Image and Office Depot.

► **Mercury Media (TV) (www.mercurymedia.com)**

Largest private DR media agency in the U.S. Specialists in TV but can also handle radio and print. Offer full tracking and reporting to determine ROI.

► **Euro RSCG (Cross Media) (http://www.eurorscgedge.com /)**

One of the worldwide leaders in DRTV media across all platforms.

► **Canella Media Response Television (TV) (http://www.drtv.com)**

Uses the innovative P/I (per inquiry) model for compensation, where you split order profits instead of paying for time upfront. This is more expensive per order if you have a successful campaign, but it lowers upfront investment in media.

► **Marketing Architects (Radio) (www.marketingarchitects.com)**

The de facto leaders in radio DR but a bit on the expensive side. Almost all of the most successful DR products—Carlton Sheets No Money Down, Tony Robbins, etc.—have used them.

► **Radio Direct Response (Radio) (www.radiodirect.com)**

Mark Lipsky has put together a great firm, with clients ranging from small direct marketers to Travel Channel and Wells Fargo.

Online Marketing and Research Firms (PPC campaign management, etc.)

Starting Small—Find a Local Individual to Help

► **SEMPO (www.sempo.org;** see the member directory)

Excellent Mid-Size Firms

► **Clicks 2 Customers (www.clicks2customers.com)**

► Working Planet (www.workingplanet.com)

The Hard-Hitting Pros—Small Campaigns Start at Several Thousand Dollars

► **Marketing Experiments (www.marketingexperiments.com)** This is my team.

► **Did It (www.did-it.com)**

► **ROIRevolution (www.roirevolution.com)**

Cost is determined by a percentage above monthly PPC spend.

► **iProspect (www.iprospect.com)**

Full-Service Infomercial Producers

These are the companies that made Oreck Direct, Nutrisystem, Nordic-Track, and Hooked on Phonics household names. The first has an excellent DRTV glossary and both sites offer excellent resources. Don't call unless you can budget at least $15,000 for a short-form commercial or $50,000+ for a long-form infomercial.

► **Cesari Direct (http://www.cesaridirect.com /)**

► Hawthorne Direct (www.hawthornedirect.com)

► Script-to-Screen (www.scripttoscreen.com)

Retail and International Product Distribution

Want to get your product on the shelves of Wal-Mart, Costco, Nordstrom, or the leading department store in Japan? Sometimes it pays to have experts with relationships get you there.

► **Tristar Products (http://www.tristarproductsinc.com)**

Behind the PowerJuicer and other hits. Tristar also owns their own production studio and can therefore offer end-to-end services in addition to retail distribution.

► **BJ Direct (International) (www.bjgd.com)**

Celebrity Brokers

Want a celebrity to endorse your product or be a spokesperson? It can cost a lot less than you think, if you do it right. I know of one clothing endorsement deal with the best pitcher in Major League Baseball that cost just $20,000 per year. Here are the brokers who can make it happen:

► **Celeb Brokers (www.celebbrokers.com)**

President Jack King was the one who first turned me on to this fascinating world. He knows it all inside and out.

► **Celebrity Endorsement Network (www.celebrityendorsement.com)**

Celebrity Finding

► **Contact Any Celebrity (www.contactanycelebrity.com)**

It is possible to do it yourself, as I have done many times. This online directory and its helpful staff will help you find any celebrity in the world.

► LIFESTYLE DESIGN IN ACTION

After I read the section on outsourcing, I thought it sounded like a novel idea but would never work for me. However, since the rest of the book was "spot on," I decided to try it. Rather than ship my money overseas, I opted to keep it in the U.S. and use my niece in college, with skills on computers I can't even fathom, to test the theory. Turns out it has been a great experience and timesaver for me, as well as moneymaker for her. It seems I have all of the positives of out sourcing but none of the hassles of language and such.... Being able to mold a young mind for the better ties in well with the rest of your book ...

—KEN D.

• • •

Hey Tim, You mentioned www.weebly.com a few months ago, and I've been using that to build all

my muse sites and think it's great! Also, Facebook groups has (almost) every niche imaginable. So what I have found success in doing is: (1) Finding a niche group that would buy my muse, (2) sending a message to each admin telling them how my muse will help their group members. Then politely asking them to put a blurb in the "Recent News" section of the group. This makes it more trustworthy than a wall post, and it stays up there (free advertising) until the admin removes it. One hundred times better than a wall post. In one case, the admin purchased my muse, posted my note for me on the groups' "Recent News" section, then e-mailed the entire group telling them they have to check out my site.

—GAVIN

50. Richard Tedlow, *Giants of Enterprise: Seven Business Innovators and the Empires They Built* (2001; reprint, HarperBusiness, 2003).

51. This is adapted from "The Remote Control CEO," *Inc*. magazine, October 2005.

52. Actually, I'm the ghost in new machines now, as I sold BrainQUICKEN in 2009 to a private equity firm.

53. "Contract outsourcing companies" can be as simple as dependable web-based services. Don't let the term intimidate you.

54. Sample e-mail responses for fulfillment purposes can be found at www.fourhourblog.com.

55 Joseph Sugarman, *Advertising Secrets of the Written Word* (DelStar Books, 1998).

56 Depending on whose math is used (number of cars vs. gross sales), some claim the original Volkswagen Beetle holds the record.

57. For the benefit of the customer and to capitalize on universal laziness (me included), provide as much time as possible to consider or forget the product. Ginsu knives offered a 50-year guarantee. Can you offer a 60-, 90-, or even 365-day guarantee? Gauge average return percentages with a 30- or 60-day guarantee first (for budgeting calculations and cash-flow projections) and then extend it.

Step IV:
L is for Liberation

It is far better for a man to go wrong in freedom than to go right in chains .

—THOMAS H. HUXLEY, English biologist; known as "Darwin's Bulldog"

HOUSE_OVERSIGHT_013938

Disappearing Act

► HOW TO ESCAPE THE OFFICE

By working faithfully eight hours a day, you may eventually get to be a boss and work twelve hours a day.

—ROBERT FROST, American poet and winner of four Pulitzer Prizes

On this path, it is only the first step that counts.

—ST. JEAN–BAPTISTE–MARIE VIANNEY, Catholic saint, "Curé d'Ars"

PALO ALTO, CALIFORNIA

"We're not going to expense the phone."

"I'm not asking you to."

Silence. Then a nod, a laugh, and a crooked smile of resignation.

"OK, then—it's fine."

And that was that, lickity-split. Forty-four-year old Dave Camarillo, lifelong employee, had cracked the code and started his second life.

He hadn't been fired; he hadn't been yelled at. His boss seemed to be handling the whole situation quite well. Granted, Dave delivered the goods on the job, and it wasn't like he was doing naked snow angels in client meetings, but still—he had just spent 30 days in China without telling anyone.

"It wasn't half as hard as I thought it would be."

Dave works among more than 10,000 employees at Hewlett- Packard (HP), and—against all odds—he actually likes it. He has no desire to start his own company and has spent the last seven years doing tech support for customers in 45 states and 22 countries. Six months ago, however, he had a small problem.

She measured 5′2″ and weighed 110 pounds.

Was he, like most men, afraid of commitment, unwilling to stop running around the house in Spider-Man underoos, or inseparable from the last refuge of any self-respecting man, the PlayStation? No, he was past all that. In fact, Dave was locked and loaded, ready to pop the big question, but he was short on vacation days and his girlfriend lived out of town. Waaaaay out of town—5,913 miles out of town.

He had met her on a client visit to Shenzhen, China, and it was now time to meet the parents, logistics be damned.

Dave had only recently begun to take tech calls at home, and, well, isn't home where the heart is? One plane ticket and one T-Mobile GSM tri-band phone later, he was somewhere over the Pacific en route to his first seven-day experiment. Twelve time zones hence, he proposed, she accepted, and no one was the wiser stateside.

The second field trip was a 30-day tour of Chinese family and food (pig face, anyone?), ending with Shumei Wu becoming Shumei Camarillo. Back in Palo Alto, HP continued its quest for world domination, neither knowing nor caring where Dave was. He had his calls forwarded to his newly begotten wife's cell phone and all was right in the world.

Now back in the U.S. after hoping for the best and preparing for the worst, Dave had earned his Eagle Scout mobility badge. The future looks flexible, indeed. He is going to start by spending two months in China every summer and then move to Australia and Europe to make up for lost time, all with the full support of his boss.

The key to cutting the leash was simple—he asked for forgiveness instead of permission.

"I didn't travel for 30 years of my life—so why not?"

• • •

THAT'S PRECISELY THE question everyone should be asking—why the hell not?

From Caste to Castaway

The old rich, the upper class of yore with castles and ascots and irritating little lapdogs, are characterized as being well-established in one place. The Schwarzes of Nantucket and the McDonnells of Charlottesville. Blech. Summers in the Hamptons is sooooo 1990s.

The guard is changing. Being bound to one place will be the new defining feature of middle class. The New Rich are defined by a more elusive power than simple cash—unrestricted mobility. This jet-setting is not limited to start-up owners or freelancers. Employees can pull it off, too.[58]

Not only can they pull it off, but more and more companies want them to pull it off. BestBuy, the consumer electronics giant, is now sending thousands of employees home from their HQ in Minnesota and claims not only lowered costs, but also a 10–20% increase in results. The new mantra is this: Work wherever and whenever you want, but get your work done.

In Japan, a three-piece zombie who joins the 9–5 grind each morning is called a *sarari-man* —salaryman—and, in the last few years, a new verb has emerged: *datsu-sara suru*, to escape (datsu) the salaryman (sara) lifestyle.

It's your turn to learn the datsu-sara dance.[59]

Trading Bosses for Beer: An Oktoberfest Case Study

To create the proper leverage to be unshackled, we'll do two things: demonstrate the business benefit of remote working and make it too expensive or excruciating to refuse a request for it.

Remember Sherwood?

His French shirts are beginning to move and he is itching to ditch the U.S. for a global walkabout. He has more than enough cash now but needs to escape constant supervision in the office before he can

implement all the timesaving tools from **Elimination** and travel.

He is a mechanical engineer and is producing twice as many designs in half the time since erasing 90% of his time-wasters and interruptions. This quantum leap in performance has been noticed by his supervisors and his value to the company has increased, making it more expensive to lose him. More value means more leverage for negotiations. Sherwood has been sure to hold back some of his productivity and efficiency so that he can highlight a sudden jump in both during a remote work trial period.

Since eliminating most of his meetings and in-person discussions, he has naturally moved about 80% of all communication with his boss and colleagues to e-mail and the remaining 20% to phone. Not only this, but he has used tips from chapter 7, "Interrupting Interruption and the Art of Refusal," to cut unimportant and repetitive e-mail volume in half. This will make the move to remote less noticeable, if at all noticeable, from a managerial standpoint. Sherwood is running at full speed with less and less supervision.

Sherwood implements his escape in five steps, beginning on July 12 during the slow business season and lasting two months, ending with a trip to Oktoberfest in Munich, Germany, for two weeks as a final test before bigger and bolder vagabonding plans.

Step 1: Increase Investment

First, he speaks with his boss on **July 12** about additional training that might be available to employees. He proposes having the company pay for a four-week industrial design class to help him better interface with clients, being sure to mention the benefit to the boss and business (i.e., he'll decrease intradepartmental back-and-forth and increase both client results and billable time). Sherwood wants the company to invest as much as possible in him so that the loss is greater if he quits.

Step 2: Prove Increased Output Offsite

Second, he calls in sick the next Tuesday and Wednesday, **July 18 and 19**, to showcase his remote working productivity.[60] He decides to call in sick between Tuesday and Thursday for two reasons: It looks less like a lie for a three-day weekend and it also enables him to see how well he functions in social isolation without the imminent reprieve of the weekend. He ensures that he doubles his work output on both days, leaves an e-mail trail of some sort for his boss to notice, and keeps quantifiable records of what he accomplished for reference during later negotiations. Since he uses expensive CAD software that is only licensed on his office desktop, Sherwood installs a free trial of GoToMyPC remote access software so that he can pilot his office computer from home.

Step 3: Prepare the Quantifiable Business Benefit

Third, Sherwood creates a bullet-point list of how much more he achieved outside the office with explanations. He realizes that he needs to present remote working as a good business decision and not a personal perk. The quantifiable end result was three more designs per day than his usual average and three total hours of additional billable client time. For explanations, he identifies removal of commute and fewer distractions from office noise.

Step 4: Propose a Revocable Trial Period

Fourth, fresh off completing the comfort challenges from previous chapters, Sherwood confidently proposes an innocent one-day-per-week remote work trial period for two weeks. He plans a script in advance but does not make it a PowerPoint presentation or otherwise give it the appearance of something

serious or irreversible.[61]

Sherwood knocks on his boss's office door around 3 P.M. on a relatively relaxed Thursday, **July 27**, the week after his absence, and his script looks like the following. Stock phrases are underlined and footnotes explain negotiating points.

Sherwood: Hi, Bill. Do you have a quick second?

Bill: Sure. What's up?

Sherwood: I just wanted to bounce an idea off of you that's been on my mind. Two minutes should be plenty.

Bill: OK. Shoot.

Sherwood: Last week, as you know, I was sick. Long story short, I decided to work at home despite feeling terrible. So here's the funny part. I thought I would get nothing done, but ended up finishing three more designs than usual on both days. Plus, I put in three more billable hours than usual without the commute, office noise, distractions, etc. OK, so here's where I'm going. Just as a trial, I'd like to propose working from home Mondays and Tuesdays for just two weeks. You can veto it whenever you want, and I'll come in if we need to do meetings, but I'd like to try it for just two weeks and review the results. I'm 100% confident that I'll get twice as much done. Does that seem reasonable?

Bill: Hmm … What if we need to share client designs?

Sherwood: There's a program called GoToMyPC that I used to access the office computer when I was sick. I can view everything remotely, and I'll have my cell phone on me 24/7. Sooooo … What do you think? Test it out starting next Monday and see how much more I get done?[62]

Bill: Ummm … OK, fine. But it's just a test. I have a meeting in five and have to run, but let's talk soon.

Sherwood: Great. Thanks for the time. I'll keep you posted on it all. I'm sure you'll be pleasantly surprised.

Sherwood didn't expect to get two days per week approved. He asked for two so that, in the case his boss refused, he could ask for just one as a fallback position (bracketing). Why didn't Sherwood go for five days remote per week? Two reasons. First, it's a lot for management to accept off the bat. We need to ask for an inch and turn it into a foot without setting off panic alarms. Second, it is a good idea to hone your remote-working abilities—rehearse a bit—before shooting for the big time, as it decreases the likelihood of crises and screwups that will get remote rights revoked.

Step 5: Expand Remote Time

Sherwood ensures that his days outside of the office are his most productive to date, even minimally dropping in-office production to heighten the contrast. He sets a meeting to discuss the results with his boss on **August 15** and prepares a bullet-point page detailing increased results and items completed compared to in-office time. He suggests upping the ante to four days per week remote for a two-week trial, fully prepared to concede to three days if need be.

Sherwood: It really turned out even better than I expected. If you look at the numbers, it makes a lot of business sense, and I'm enjoying work a lot more now. So, here we are. I'd like to suggest, if you think it makes sense, that I try four days a week for another two-week trial. I was thinking that coming in Friday[63]would make sense to prepare for the coming week, but we could do whichever day you prefer.

Bill: Sherwood, I'm really not sure we can do that.

Sherwood: What's your main concern?[64]

Bill: It seems like you're on your way out. I mean, are you going to quit on us? Second, what if everyone wants to do the same?

Sherwood: Fair enough. Good points.[65] First, to be honest, I was close to quitting before, with all the interruptions and commute and whatnot, but I'm actually feeling great now with the change in routine.[66] I'm doing more and feel relaxed for a change. Second, no one should be allowed to work remotely unless they can show increased productivity, and I'm the perfect experiment. If they can show it, however, why not let them do it on a trial basis? It lowers costs for the office, increases productivity, and makes employees happier. So, what do you say? Can I test it out for two weeks and come in Fridays to take care of the office stuff? I'll still document everything, and you, of course, have the right to change your mind at any point.

Bill: Man, you are an insistent one. OK, we'll give it a shot, but don't go blabbing about it.

Sherwood: Of course. Thanks, Bill. I appreciate the trust. Talk to you soon.

Sherwood continues to be productive at home and maintains his lower in-office performance. He reviews the results with his boss after two weeks and continues with four remote days per week for an additional two weeks until Tuesday, **September 19**, when he requests a full-time remote trial of two weeks while he is visiting relatives out of state.[67] Sherwood's team is in the middle of a project that requires his expertise, and he is prepared to quit if his boss refuses. He realizes that, just as you want to negotiate ad pricing close to deadlines, getting what you want often depends more on *when* you ask for it than *how* you ask for it. Though he would prefer not to quit, his income from shirts is more than enough to fund his dream-lines of Oktoberfest and beyond.

His boss acquiesces and Sherwood doesn't have to use his threat of quitting. He goes home that evening and buys a $524 round-trip ticket, less than one week's shirt sales, to Munich for Oktoberfest.

Now he can implement all the time-savers possible and hack out the inessentials. Somewhere between drinking wheat beer and dancing in lederhosen, Sherwood will get his work done in fine form, leaving his company better off than prior to 80/20 and leaving himself all the time in the world.

But hold on a second … What if your boss still refuses? Hmm … Then they force your hand. If upper management won't see the light, you'll just have to use the next chapter to fire their asses.

An Alternative: The Hourglass Approach

It can be effective to take a longer period of absence up front in what some **NR** have termed the "hourglass" approach, so named because you use a long proof-of-concept up front to get a short remote agreement and then negotiate back up to full-time out of the office. Here's what it looks like.

1. Use a preplanned project or emergency (family issue, personal issue, relocation, home repairs, whatever) that requires you to take one or two weeks out of the office.
2. Say that you recognize you can't just stop working and that you would prefer to work instead of taking vacation days.
3. Propose how you can work remotely and offer, if necessary, to take a pay cut for that period (and that period only) if performance isn't up to par upon returning.
4. Allow the boss to collaborate on how to do it so that he or she is invested in the process.

5. Make the two weeks "off" the most productive period you've ever had at work.
6. Show your boss the quantifiable results upon returning, and tell him or her that—without all the distractions, commute, etc.—you can get twice as much done. Suggest two or three days at home per week as a trial for two weeks.
7. Make those remote days ultraproductive.
8. Suggest only one or two days in the office per week.
9. Make those days the least productive of the week.
10. Suggest complete mobility—the boss will go for it.

► Q&A: QUESTIONS AND ACTIONS

Recently, I was asked if I was going to fire an employee who made a mistake that cost the company $600,000. No, I replied, I just spent $600,000 training him.

—THOMAS J. WATSON, founder of IBM

Liberty means responsibility. That is why most men dread it.

—GEORGE BERNARD SHAW

While entrepreneurs have the most trouble with **Automation**, since they fear giving up control, employees get stuck on **Liberation** because they fear taking control. Resolve to grab the reins—the rest of your life depends on it.

The following questions and actions will help you to replace presence-based work with performance-based freedom.

1. **If you had a heart attack, and assuming your boss were sympathetic, how could you work remotely for four weeks?**

   If you hit a brick wall with a task that doesn't seem remote-compatible or if you predict resistance from your boss, ask the following:

   - ► What are you accomplishing with this task—what is the purpose?
   - ► If you *had to* find other ways to accomplish the same—if your life depended on it—how would you do it? Remote conferencing? Video conferencing? GoToMeeting, GoToMyPC, DimDim.com (Mac), or related services?
   - ► Why would your boss resist remote work? What is the

immediate negative effect it would have on the company and what could you do to prevent or minimize it?

2. **Put yourself in your boss's shoes. Based on your work history, would you trust yourself to work outside of the office?**

   If you wouldn't, reread **Elimination** to improve production and consider the hourglass option.

3. **Practice environment-free productivity**.

   Attempt to work for two to three hours in a café for two Saturdays prior to proposing a remote trial. If you exercise in a gym, attempt to exercise for those two weeks at home or otherwise outside of the gym environment. The purpose here is to separate your activities from a single environment and ensure that you have the discipline to work solo.

4. **Quantify current productivity**.

   If you have applied the 80/20 Principle, set the rules of interrupting interruption, and completed related groundwork, your performance should be at an all-time high in quantifiable terms, whether customers served, revenue generated, pages produced, speed of accounts receivable, or otherwise. Document this.

5. **Create an opportunity to demonstrate remote work productivity before asking for it as a policy**.

   This is to test your ability to work outside of an office environment and rack up some proof that you can kick ass without constant supervision.

6. **Practice the art of getting past "no" before proposing**.

   Go to farmers' markets to negotiate prices, ask for free first-class upgrades, ask for compensation if you encounter poor service in restaurants, and otherwise ask for the world and practice using the following magic questions when people refuse to give it to you.

   "What would I need to do to [desired outcome]?"
   "Under what circumstances would you [desired outcome]?"
   "Have you ever made an exception?"
   "I'm sure you've made an exception before, haven't you?"
   (If no for either of the last two, ask, "Why not?" If yes, ask, "Why?")

7. **Put your employer on remote training wheels—propose Monday or Friday at home**.

   Consider doing this, or the following step, during a period when it would be too disruptive to fire you, even if you were marginally less productive while remote.

   If your employer refuses, it's time to get a new boss or become an entrepreneur. The job will never give you the requisite time freedom. If you decide to jump ship, consider letting them make you walk the plank—quitting is often less appealing than tactfully getting fired and using severance or unemployment to take a long vacation.

8. **Extend each successful trial period until you reach full-time or your desired level of mobility**.

   Don't underestimate how much your company needs you. Perform well and ask for what you want. If you don't get it over time, leave. It's too big a world to spend most of life in a cubicle.

► LIFESTYLE DESIGN IN ACTION

Consider trying Earth Class Mail, a service that you can reroute all your mail to, at which point they

scan and e-mail you everything that comes in, giving you the option of recycling/shredding junk, getting a scan of the contents, or having specific items forwarded to you or someone you designate. I have not personally used it yet (will be testing it out this month in preparation for an upcoming trip in May), but a friend and author in Portland swears by them and knows the CEO. Seems they've gotten good press and the idea seems far better than relying on friends/family who, if they're anything like my friends/family … will surely drop the ball at some point:-).

—NATHALIE

• • •

I also use GreenByPhone.com to process checks electronically that come in through my Earth Class Mail account—they charge $5 a check, but I live in San Diego, my Earth Class Mail office address is in Seattle, and I bank in Ohio. It works great!

—ANDREW

• • •

To add to your excellent list (we've traveled just like that for several years SWEET!), I'd like to add my modifications as a female traveler and a new mom (16-month-old baby). Personal favorites: (1) Athleta carries excellent, light, quick-dry clothing that hold up well to sports but still look very fashionable. Skorts are a must for looking feminine but being fully covered for hiking and steep pyramid steps—you know what I mean, ladies! Just a note, a slightly longer length will serve you well in a lot of countries, as well as tankini tops and swim skirts for swimming. (2) Fresh & Go toothbrush is simple to use. (3) Marsona sound machine for drowning out unfamiliar noises is a must (regularly use with baby at home too so when they hear the sound they know it's sleep time!). This has been a lifesaver for us on many trips, and we now use it regularly at home for better sleep. No more changing hotels midtrip to avoid noise. AND, I know we have to travel light, but with baby a lot of things are nonnegotiable. These make for smoother sailing: (1) Peanut shell sling in black fleece—it's more comfy than the cotton and you can pop baby in and out wherever you are, from birth to 35 lbs. I never take mine off, it's part of my outfit; (2) Peapod plus portable tent—this is baby's main bed at home and travel so baby has the same sleep place everywhere we go, and the flaps give all travel parties privacy—great from small babies to five-year-olds. I can still jam this onto a little wheeled carry-on and pack mine and baby's minimal clothing around it; (3) Go Go Kidz TravelMate (great for wheeling car seat up to the gate for gate check or use on plane); (4) Britax Diplomat car seat is small but kids can use it from birth to approx. four years old.

Make sure the wheeled carry-on bag you get is one size smaller than the allowed carry-on size so you don't get bumped to check the bag in if the plane is full. You can always nicely argue/reason/bat your eyelashes that you will put the bag in your foot space. Also, very helpful to give baby something to sip or munch on during take off and landing so yours isn't the baby screaming from ear pain. Happy travels!

—KARYL

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PRE-EMPTING THE BOSS: COMMON CONCERNS ABOUT REMOTE WORK

In the linked article, Cisco acknowledges that remote work arrangements are "here to stay" yet lists a set of security issues. It makes sense to preemptively research solutions so that you are armed and ready if your employer raises these concerns. http://newsroom.cisco.com/dlls/2008/prod_020508.html.

—Contributed by RAINA

58. If you're an entrepreneur, don't skip this chapter. This introduction to remote working tools and tactics is integral to the international pieces of the puzzle that follow.

59. This verb is used by Japanese women as well, even though female workers are referred to as "OL"—office ladies.

60. Any reason to be home will do (cable or phone installation, home repairs, etc.) or, if you prefer not to use a ruse, work a weekend or take two vacation days.

61. Review the Puppy Dog Close from "Income Autopilot II: Testing the Muse."

62. Do not digress from your goal. Once you've addressed an objection or concern, go for the close.

63. Friday is the best day to be in the office. People are relaxed and tend to leave early.

64. Do not accept a vague refusal. Pinpointing the main concern in detail enables you to overcome it.

65. Don't jump to the defensive after an objection. Acknowledge the validity of a boss's concerns to prevent an ego-driven battle of wills.

66. Note this indirect threat dressed as a confession. It will make the boss think twice about refusing but prevents the win-lose outcome of an ultimatum.

67. This removes the boss's ability to call you to the office. This is critical for making the first jump overseas.

13
Beyond Repair

► KILLING YOUR JOB

All courses of action are risky, so prudence is not in avoiding danger (it's impossible), but calculating risk and acting decisively. Make mistakes of ambition and not mistakes of sloth. Develop the strength to do bold things, not the strength to suffer.

—NICCOLÒ MACHIAVELLI, *The Prince*

Existential Pleas and Resignations Mad Libs

BY ED MURRAY

Dear _____,
preferred deity of choice

I realized something very _____ today as I was washing my
adjective

_____, and that something is this: You are a/an _____
animal adverb

cruel _____.
personal expletive pronoun

Last night, after drinking seven shots of _____ and
least favorite hard liquor

snorting enough _____ to make _____ blush,
drug politician

it became clear: It really is them, and not me.

I am the one who is completely _____ when it
helpless state of being

comes to the _____ personal relationships in my life, and yet,
favorite color

I share my innermost _____ with no one else on this _____
type of candy adjective

planet . . . because they are all _____ _____.
insulting adjective extinct animals

I _____ (emotion) them all, and I hope they meet a _____ (adjective) demise choking on a platter of their own _____ (Applebee's appetizer).

This _____ (adjective) catharsis made me feel _____ (smiley emotion) and strangely alone, simultaneously. How can I connect with these _____ (herd animals) I am surrounded by on a daily basis? I am just so sick of _____ (synonym for "crying") in the _____ (part of your house) every day . . . Maybe it would help if I shoved a fistful of _____ (vegetables) into my _____ (bodily orifice). It makes my heart _____ (verb) when I see the defeat in my parents' _____ (body parts), and it becomes _____ (adverb) clear that they love the _____ (type of car) more than _____ (sibling's name) . . . Maybe I should stab my _____ (genitalia) with a _____ (sharp object).

Today I have decided to buy a _____ (noun), which will serve as a _____ (metaphor), and as a _____ (timeless adjective) symbol for the _____ (expletive)-faced servitude I am bound to in this life . . . no more in control than the most _____ (adjective)-minded of _____ (farm animals). I am trying desperately to _____ ("st__p") myself from _____ (active violent act) all of my co-workers . . . except _____ (person in the room). I've always wanted to _____ (forceful sexual act) him/her/it. I didn't ask to be _____ (verb).

Some jobs are simply beyond repair.

Improvements would be like adding a set of designer curtains to a jail cell: better but far from good. In the context of this chapter, "job" will refer to both a company if you run one and a normal job if you have one. Some recommendations are limited to one of the two but most are relevant to both. So we begin.

I have quit three jobs and been fired from most of the rest. Getting fired, despite sometimes coming as a surprise and leaving you scrambling to recover, is often a godsend: Someone else makes the decision for you, and it's impossible to sit in the wrong job for the rest of your life. Most people aren't lucky enough to get fired and die a slow spiritual death over 30–40 years of tolerating the mediocre.

Pride and Punishment

If you must play, decide on three things at the start: the rules of the game, the stakes, and the quitting time.

—CHINESE PROVERB

Just because something has been a lot of work or consumed a lot of time doesn't make it productive or worthwhile.

Just because you are embarrassed to admit that you're still living the consequences of bad decisions made 5, 10, or 20 years ago shouldn't stop you from making good decisions now. If you let pride stop you, you will hate life 5, 10, and 20 years from now for the same reasons. I hate to be wrong and sat in a dead-end trajectory with my own company until I was forced to change directions or face total breakdown—I know how hard it is.

Now that we're all on a level playing field: Pride is stupid.

Being able to quit things that don't work is integral to being a winner. Going into a project or job without defining when worthwhile becomes wasteful is like going into a casino without a cap on what you will gamble: dangerous and foolish.

"But, you don't understand my situation. It's complicated!" But is it really? Don't confuse the complex with the difficult. Most situations are simple—many are just emotionally difficult to act upon. The problem and the solution are usually obvious and simple. It's not that you don't know what to do. Of course you do. You are just terrified that you might end up worse off than you are now.

I'll tell you right now: If you're at this point, you won't be worse off. Revisit fear-setting and cut the cord.

Like Pulling Off a Band-Aid: It's Easier and Less Painful Than You Think

> The average man is a conformist, accepting miseries and disasters with the stoicism of a cow standing in the rain.
>
> —COLIN WILSON, British author of *The Outsider;* New Existentialist

There are several principal phobias that keep people on sinking ships, and there are simple rebuttals for all of them.

1. Quitting is permanent.

Far from it. Use the Q&A questions in this chapter and chapter 3 (Fear-setting) to examine how you could pick up your chosen career track or start another company at a later point. I have never seen an example where a change of direction wasn't somehow reversible.

2. I won't be able to pay the bills.

Sure you will. First of all, the objective will be to have a new job or source of cash flow before quitting your current job. Problem solved.

If you jump ship or get fired, it isn't hard to eliminate most expenses temporarily and live on savings for a brief period. From renting out your home to refinancing or selling it, there are options. There are always options.

It might be emotionally difficult, but you won't starve. Park your car in the garage and cancel insurance for a few months. Carpool or take the bus until you find the next gig. Rack up some more credit card debt and cook instead of eating out. Sell all the crap that you spent hundreds or thousands on and never use.

Take a full inventory of your assets, cash reserves, debts, and monthly expenses. How long could you survive with your current resources or if you sold some assets?

Go through all expenses and ask yourself, If I *had to* eliminate this because I needed an extra kidney, how would I do it? Don't be melodramatic when there is no need—few things are fatal, particularly for smart people. If you've made it this far in life, losing or dropping a job will often be little more than a few weeks of vacation (unless you want more) prior to something better.

3. Health insurance and retirement accounts disappear if I quit.

Untrue.

I was scared of both when I was eliminated from TrueSAN. I had visions of rotting teeth and working at Wal-Mart to survive.

Upon looking at the facts and exploring options, I realized that I could have identical medical and dental coverage—the same provider and network—for $300–500 per month. To transfer my 401(k) to another company (I chose Fidelity Investments) was even easier: It took less than 30 minutes via phone and cost nothing.

Covering both of these bases takes less time than getting a customer service rep on the phone to fix your electric bill.

4. It will ruin my resume.

I love creative nonfiction.

It is not at all difficult to sweep gaps under the rug and make uncommon items the very things that get job interviews. How? Do something interesting and make them jealous. If you quit and then sit on your ass, I wouldn't hire you either.

On the other hand, if you have a one-to-two-year world circumnavigation on your resume or training with professional soccer teams in Europe to your credit, two interesting things happen upon returning to the working world. First, you will get more interviews because you will stand out. Second, interviewers bored in their own jobs will spend the entire meeting asking how you did it!

If there is any question of why you took a break or left your previous job, there is one answer that cannot be countered: "I had a once-in-a-lifetime chance to do [exotic and envy-producing experience] and couldn't turn it down. I figured that, with [20–40] years of work to go, what's the rush?"

The Cheesecake Factor

Would you like me to give you a formula for success? It's quite simple, really. Double your rate of failure.

—THOMAS J. WATSON, founder of IBM

HOUSE_OVERSIGHT_013951

Even before I tasted it, I knew something wasn't quite right. After eight hours in the refrigerator, this cheesecake still hadn't set at all. It swished in the gallon bowl like a viscous soup, chunks shifting and bobbing as I tilted it under close inspection. Somewhere a mistake had been made. It could have been any number of things:

Three 1 lb. sticks of Philly Cream Cheese
Eggs
Stevia
Unflavored gelatin
Vanilla
Sour cream

In this case, it was probably a combination of things and the lack of a few simple ingredients that generally make cheesecake a form of cake.

I was on a no-carbohydrate diet, and I had used this recipe before. It had been so delicious that my roommates wanted their fair share and insisted on an attempt at bulk production. Hence began the mathematical shenanigans and problems.

Before Splenda® and other miracles of sugar imitation came on the scene, the hard core used stevia, an herb 300 times sweeter than sugar. One drop was like 300 packets of sugar. It was a delicate tool and I wasn't a delicate cook. I had once made a small handful of cookies using baking soda instead of baking powder, and that was bad enough to drive my roommates to puke on the lawn. This new masterpiece made the cookies look like fine dining: It tasted like liquid cream cheese mixed with cold water and about 600 packets of sugar.

I then did what any normal and rational person would do: I grabbed the largest soup ladle with a sigh and sat down in front of the TV to face my punishment. I had wasted an entire Sunday and a boatload of ingredients—it was time to reap what I had sown.

One hour and 20 large spoonfuls later, I hadn't made a dent in the enormous batch of soup, but I was down for the count. Not only could I not eat anything but soup for two days, I couldn't bring myself to even look at cheesecake, previously my favorite dessert, for more than four years.

Stupid? Of course. It's about as stupid as one can get. This is a ridiculous and micro example of what people do on a larger scale with jobs all the time: self-imposed suffering that can be avoided. Sure, I learned a lesson and paid for the mistake. The real question is—for what?

There are two types of mistakes: mistakes of ambition and mistakes of sloth.

The first is the result of a decision to act—to do something. This type of mistake is made with incomplete information, as it's impossible to have all the facts beforehand. This is to be encouraged. Fortune favors the bold.

The second is the result of a decision of sloth—to not do something—wherein we refuse to change a bad situation out of fear despite having all the facts. This is how learning experiences become terminal punishments, bad relationships become bad marriages, and poor job choices become lifelong prison sentences.

"Yeah, but what if I'm in an industry where jumping around is looked down upon? I've been here barely a year, and prospective employers would think…"

Would they? Test assumptions before condemning yourself to more misery. I've seen one determinant of sex appeal to good employers: performance. If you are a rock star when it comes to results, it doesn't matter if you jump ship from a bad company after three weeks. On the other hand, if tolerating a punishing work environment for years at a time is a prerequisite for promotion in your field, could it be

that you're in a game not worth winning?

The consequences of bad decisions do not get better with age.

What cheesecake are you eating?

► Q&A: QUESTIONS AND ACTIONS

Only those who are asleep make no mistakes.

—INGVAR KAMPRAD, founder of IKEA, world's largest furniture brand

Tens of thousands of people, most of them less capable than you, leave their jobs every day. It's neither uncommon nor fatal. Here are a few exercises to help you realize just how natural job changes are and how simple the transition can be.

1. First, a familiar reality check: Are you more likely to find what you want in your current job or somewhere else?
2. If you were fired from your job today, what would you do to get things under financial control?
3. Take a sick day and post your resume on the major job sites. Even if you have no immediate plans to leave your job, post your resume on sites such as www.monster.com and www.career-builder.com, using a pseudonym if you prefer. This will show you that there are options besides your current place of work. Call headhunters if your level makes such a step appropriate, and send a brief e-mail such as the one below to friends and non-work contacts.

   Dear All,

   I am considering making a career move and am interested in all opportunities that might come to mind. Nothing is too outrageous or out of left field. [If you know what you want or don't want on some level, feel free to add, "I am particularly interested in …" or "I would like to avoid …"]

   Please let me know if anything comes to mind!

   Tim

   Call in sick or take a vacation day to complete all of these exercises during a normal 9–5 workday. This will simulate unemployment and lessen the fear factor of non-office limbo.

   In the world of action and negotiation, there is one principle that governs all others: The person who has more options has more power. Don't wait until you need options to search for them. Take a sneak peek at the future now and it will make both action and being assertive easier.
4. If you run or own a company, imagine that you have just been sued and must declare bankruptcy. The company is now insolvent and you must close up shop. This is something you *must* legally do, and there are no finances to entertain other options. How would you survive?

► TOOLS AND TRICKS

Considering Options and Pulling the Trigger

► **I-Resign (www.i-resign.com)**

This site provides everything from non-quitting options (work-leave, vacations) to sample resignation letters and second-life job-hunting advice. Don't miss the helpful discussion forums and hysterical "web consultant from London" letter.

Opening Retirement Accounts

If you want an adviser and don't mind some fees:

► **Franklin-Templeton (www.franklintempleton.com) (800–527–2020)**

► **American Funds (www.americanfunds.com) (800–421–0180)**

If you will do your own investing and want no-load funds:

► **Fidelity Investments (www.fidelity.com) (800–343–3548)**

► **Vanguard (www.vanguard.com) (800–414–1321)**

Health Insurance for Self-employed or Unemployed (in descending order of reader endorsement)

► **Ehealthinsurance (www.ehealthinsurance.com) (800–977–8860)**

► **AETNA (www.aetna.com) (800-MY-HEALTH)**

► **Kaiser Permanente (www.kaiserpermanente.com) (866–352–0290)**

► **American Community Mutual (www.american-community.com) (800–991–2642)**

14
Mini-Retirements

► **EMBRACING THE MOBILE LIFESTYLE**

Before the development of tourism, travel was conceived to be like study, and its fruits were considered to be the adornment of the mind and the formation of the judgment.

—PAUL FUSSELL, *Abroad*

The simple willingness to improvise is more vital, in the long run, than research.

—ROLF POTTS, *Vagabonding*

Upon Sherwood's return from Oktoberfest, dazed from killing neurons but the happiest he's been in four years, the remote trial is made policy and Sherwood is inducted into the world of the New Rich. All he needs now is an idea of how to exploit this freedom and the tools to give his finite cash near-infinite lifestyle output.

If you've gone through the previous steps, eliminating, automating, and severing the leashes that bind you to one location, it's time to indulge in some fantasies and explore the world.

Even if you have no ache for extended travel or think it's impossible—whether due to marriage or mortgage or those little things known as children—this chapter is still the next step. There are fundamental changes I and most others put off until absence (or preparation for it) forces them. This chapter is your final exam in muse design.

The transformation begins in a small Mexican village, in a parable that's been shared in various forms around the world.

Fables and Fortune Hunters

An American businessman took a vacation to a small coastal Mexican village on doctor's orders. Unable to sleep after an urgent phone call from the office the first morning, he walked out to the pier to clear his head. A small boat with just one fisherman had docked, and inside the boat were several large yellowfin tuna. The American complimented the Mexican on the quality of his fish.

"How long did it take you to catch them?" the American asked.

"Only a little while," the Mexican replied in surprisingly good English.

"Why don't you stay out longer and catch more fish?" the American then asked.

"I have enough to support my family and give a few to friends," the Mexican said as he unloaded them into a basket.

"But … What do you do with the rest of your time?"

The Mexican looked up and smiled. "I sleep late, fish a little, play with my children, take a siesta with my wife, Julia, and stroll into the village each evening, where I sip wine and play guitar with my amigos. I have a full and busy life, señor."

The American laughed and stood tall. "Sir, I'm a Harvard M.B.A. and can help you. You should spend more time fishing, and with the proceeds, buy a bigger boat. In no time, you could buy several boats with the increased haul. Eventually, you would have a fleet of fishing boats."

He continued, "Instead of selling your catch to a middleman, you would sell directly to the consumers, eventually opening your own cannery. You would control the product, processing, and distribution. You

would need to leave this small coastal fishing village, of course, and move to Mexico City, then to Los Angeles, and eventually New York City, where you could run your expanding enterprise with proper management."

The Mexican fisherman asked, "But, señor, how long will all this take?"

To which the American replied, "15–20 years. 25 tops."

"But what then, señor?"

The American laughed and said, "That's the best part. When the time is right, you would announce an IPO and sell your company stock to the public and become very rich. You would make millions."

"Millions, señor? Then what?"

"Then you would retire and move to a small coastal fishing village, where you would sleep late, fish a little, play with your kids, take a siesta with your wife, and stroll to the village in the evenings where you could sip wine and play your guitar with your amigos …"

I RECENTLY HAD lunch in San Francisco with a good friend and former college roommate. He will soon graduate from a top business school and return to investment banking. He hates coming home from the office at midnight but explained to me that, if he works 80-hour weeks for nine years, he could become a managing director and make a cool $3–10 million per year. Then he would be successful.

"Dude, what on earth would you do with $3–10 million per year?" I asked.

His answer? "I would take a long trip to Thailand."

That just about sums up one of the biggest self-deceptions of our modern age: extended world travel as the domain of the ultrarich. I've also heard the following:

"I'll just work in the firm for 15 years. Then I'll be partner and I can cut back on hours. Once I have a million or two in the bank, I'll put it in something safe like bonds, take $80,000 a year in interest, and retire to sail in the Caribbean."

"I'll only work in consulting until I'm 35, then retire and ride a motorcycle across China."

If your dream, the pot of gold at the end of the career rainbow, is to live large in Thailand, sail around the Caribbean, or ride a motorcycle across China, guess what? All of them can be done for less than $3,000. I've done all three. Here are just two examples of how far a little can go.[68]

$250 U.S. Five days on a private Smithsonian tropical research island with three local fishermen who caught and cooked all my food and also took me on tours of the best hidden dive spots in Panamá.

$150 U.S. Three days of chartering a private plane in Mendoza wine country in Argentina and flying over the most beautiful vineyards around the snowcapped Andes with a personal guide.

Question: What did you spend your last $400 on? It's two or three weekends of nonsense and throwaway forget-the-workweek behavior in most U.S. cities. $400 is nothing for a full eight days of life-changing experiences. But eight days isn't what I'm recommending at all. Those were just interludes in a much larger production. I'm proposing much, much more.

The Birth of Mini-Retirements and the Death of Vacations

There is more to life than increasing its speed.

—MOHANDAS GANDHI

In February of 2004, I was miserable and overworked.

My travel fantasy began as a plan to visit Costa Rica in March 2004 for four weeks of Spanish and relaxation. I needed a recharge and four weeks seemed "reasonable" by whatever made-up benchmark you can use for such a thing.

A friend familiar with Central America dutifully pointed out that it would never work, as Costa Rica was about to enter its rainy season. Torrential downpours weren't the uplifting jolt I needed, so I shifted my focus to four weeks in Spain. It's a long trip over the Atlantic, though, and Spain was close to other countries I'd always wanted to visit. I lost "reasonable" somewhere shortly thereafter and decided that I deserved a full three months to explore my roots in Scandinavia after four weeks in Spain.

If there were any real-time bombs or pending disasters, they would certainly crop up in the first four weeks, so *there really wasn't any additional risk in extending my trip to three months*. Three months would be great.

Those three months turned into 15, and I started to ask myself, "Why not take the usual 20–30-year retirement and redistribute it throughout life instead of saving it all for the end?"

The Alternative to Binge Traveling

Thanks to the Interstate Highway System, it is now possible to travel from coast to coast without seeing anything.

—CHARLES KURALT, CBS news reporter

If you are accustomed to working 50 weeks per year, the tendency, even after creating the mobility to take extended trips, will be to go nuts and see 10 countries in 14 days and end up a wreck. It's like taking a starving dog to an all-you-can-eat buffet. It will eat itself to death.

I did this three months into my 15-month vision quest, visiting seven countries and going through at least 20 check-ins and checkouts with a friend who had negotiated three weeks off. The trip was an adrenaline-packed blast but like watching life on fast-forward. It was hard for us to remember what had happened in which countries (except Amsterdam),[69] we were both sick most of the time, and we were upset to have to leave some places simply because our pre-purchased flights made it so.

I recommend doing the exact opposite.

The alternative to binge travel—the mini-retirement—entails relocating to one place for one to six months before going home or moving to another locale. It is the anti-vacation in the most positive sense. Though it can be relaxing, the mini-retirement is not an escape from your life but a reexamination of it—the creation of a blank slate. Following elimination and automation, what would you be escaping from? Rather than seeking to *see* the world through photo ops between foreign-but-familiar hotels, we aim to *experience* it at a speed that lets it change us.

This is also different from a sabbatical. Sabbaticals are often viewed much like retirement: as a one-time event. Savor it now while you can. The mini-retirement is defined as recurring—it is a *lifestyle*. I

currently take three or four mini-retirements per year and know dozens who do the same. Sometimes these sojourns take me around the world; oftentimes they take me around the corner—Yosemite, Tahoe, Carmel—but to a different world psychologically, where meetings, e-mail, and phone calls don't exist for a set period of time.

Purging the Demons: Emotional Freedom

This is the very perfection of a man, to find out his own im perfection.

—SAINT AUGUSTINE (354 A.D.–430 A.D.)

True freedom is much more than having enough income and time to do what you want. It is quite possible—actually the rule rather than the exception—to have financial and time freedom but still be caught in the throes of the rat race. One cannot be free from the stresses of a speed- and size-obsessed culture until you are free from the materialistic addictions, time-famine mind-set, and comparative impulses that created it in the first place.

This takes time. The effect is not cumulative, and no number of two-week (also called "too weak")[70] sightseeing trips can replace one good walkabout.[71]

In the experience of those I've interviewed, it takes two to three months just to unplug from obsolete routines and become aware of just how much we distract ourselves with constant motion. Can you have a two-hour dinner with Spanish friends without getting anxious? Can you get accustomed to a small town where all businesses take a siesta for two hours in the afternoon and then close at 4:00 P.M.? If not, you need to ask, Why?

Learn to slow down. Get lost intentionally. Observe how you judge both yourself and those around you. Chances are that it's been a while. Take at least two months to disincorporate old habits and rediscover yourself without the reminder of a looming return flight.

The Financial Realities: It Just Gets Better

The economic argument for mini-retirements is the icing on the cake. Four days in a decent hotel or a week for two at a nice hostel costs the same as a month in a nice posh apartment. If you relocate, the expenses abroad also begin to replace—often at much lower cost—bills you can then cancel stateside.

Here are some actual monthly figures from recent travels.

Highlights from both South America and Europe are shown side by side to prove that luxury is limited by your creativity and familiarity with the locale, not gross currency devaluation in third-world countries. It will be obvious that I did not survive on bread and begging—I lived like a rock star—and both experiences could be done for less than 50% of what I spent. My goal was enjoyment and not austere survival.

Airfare

- ► Free, courtesy of AMEX gold card and Chase Continental Airlines Mastercard [72]

Housing

- ► Penthouse apartment on the equivalent of New York's Fifth Avenue in Buenos Aires, including house cleaners, personal security guards, phone, energy, and high-speed Internet: $550 U.S. per month

- ► Enormous apartment in the trendy SoHo-like Prenzlauerberg district of Berlin, including phone and energy: $300 U.S. per month

Meals

- ► Four- or five-star restaurant meals twice daily in Buenos Aires: $10 U.S. ($300 U.S. per month)

- ► Berlin: $18 U.S. ($540 U.S. per month)

Entertainment

- ► VIP table and unlimited champagne for eight people at the hottest club, Opera Bay, in Buenos Aires: $150 U.S. ($18.75 U.S. per person **x** four visits per month = $75 U.S. per month per person)

- ► Cover, drinks, and dancing at the hottest clubs in West Berlin: $20 U.S. per person per night **x** 4 = $80 U.S. per month

Education

- ► Two hours daily of private Spanish lessons in Buenos Aires, fives times per week: $5 U.S. per hour **x** 40 hours per month = $200 U.S. per month

- ► Two hours daily of private tango lessons with two world-class professional dancers: $8.33 U.S. per hour **x** 40 hours per month = $333.20 U.S. per month

- ► Four hours daily of top-tier German-language instruction in Nollendorfplatz, Berlin: $175 U.S. per month, which would have paid for itself even if I had not attended classes, as the student ID card entitled me to over 40% discounts on all transportation

- ► Six hours per week of mixed martial arts (MMA) training at the top Berlin academy: free in exchange for tutoring in English two hours per week

Transportation

- ► Monthly subway pass and daily cab rides to and from tango lessons in Buenos Aires: $75 U.S. per month

- ► Monthly subway, tram, and bus pass in Berlin with student discount: $85 U.S. per month

Four-Week Total for Luxury Living

- ► **Buenos Aires: $1533.20** , including round-trip airfare from JFK, with a one-month stopover in Panamá. Nearly one-third of this total is from the daily one-on-one instruction from world-class teachers in Spanish and Tango.

- ► **Berlin: $1180** , including round-trip airfare from JFK and a one-week stopover in London.

How do these numbers compare to your current domestic monthly expenses, including rent, car insurance, utilities, weekend expenditures, partying, public transportation, gas, memberships, subscriptions, food, and all the rest? Add it all up and you may well realize, like I did, that traveling around the world and having the time of your life can save you serious money.

Fear Factors: Overcoming Excuses Not to Travel

Travelling is the ruin of all happiness! There's no looking at a building here after seeing Italy.
—FANNY BURNEY (1752–1840), English novelist

But I have a house and kids. I can't travel!
What about health insurance? What if something happens?
Isn't travel dangerous? What if I get kidnapped or mugged?
But I'm a woman—traveling alone would be dangerous.

Most excuses not to travel are exactly that—excuses. I've been there, so this isn't a holier-than-thou sermon. I know too well that it's easier to live with ourselves if we cite an external reason for inaction.

I've since met paraplegics and the deaf, senior citizens and single mothers, home owners and the poor, all of whom have sought and found excellent life-changing reasons for extended travel instead of dwelling on the million small reasons *against it*.

Most of the concerns above are addressed in the Q&A, but one in particular requires a bit of preemptive nerve calming.

It's 10:00 P.M. Do You Know Where Your Children Are?

The prime fear of all parents prior to their first international trip is somehow losing a child in the shuffle.

The good news is that if you are comfortable taking your kids to New York, San Francisco, Washington, D.C., or London, you will have even less to worry about in the starting cities I recommend in the Q&A. There are fewer guns and violent crimes in all of them compared to most large U.S. cities. The likelihood of problems is decreased further when travel is less airport and hotel-hopping among strangers and more relocation to a second home: a mini-retirement.

But still, what if?

Jen Errico, a single mother who took her two children on a five-month world tour, had a more acute fear than most, one that often woke her at 2:00 A.M. in a cold sweat: What if something happens to me?

She wanted to prime her kids for worst-case scenario but didn't want to scare them to death, so—like all good mothers—she made it a game: Who can best memorize the itineraries, hotel addresses, and Mom's phone number? She had emergency contacts in each country whose numbers were loaded into the speed dial of her cell phone, which had global roaming. In the end, nothing happened. Now she's planning to move to a ski chalet in Europe and send her kids to school in multilingual France. Success

begets success.

She was most afraid in Singapore, and in retrospect, it was where she had the least reason to be worried (she took her kids to South Africa, among other places). She was scared because it was the first stop and she was unaccustomed to traveling with her kids. It was perception, not reality.

Robin Malinsky-Rummell, who spent a year traveling through South America with her husband and seven-year-old son, was warned by friends and family not to visit Argentina after their devaluation riots in 2001. She did her homework, decided that the fear was unfounded, and proceeded to have the time of her life in Patagonia. When she told locals that she was originally from New York, their eyes widened and jaws dropped: "I saw those buildings blow up on TV! I would never go to such a dangerous place!" Don't assume that places abroad are more dangerous than your hometown. Most aren't.

Robin is convinced, as are other **NR** parents, that people use children as an excuse to stay in their comfort zones. It's an easy excuse not to do something adventurous. How to overcome the fear? Robin recommends two things:

1. Before embarking on a long international trip with your children for the first time, take a trial run for a few weeks.
2. For each stop, arrange a week of language classes that begin upon arrival and take advantage of transportation from the airport if available. The school staff will often handle apartment rentals for you, and you will be able to make friends and learn the area before setting off on your own.

But what if your concern isn't so much losing your children but losing your mind because of your children?

Several families interviewed for this book recommended the oldest persuasive tool known to man: bribery. Each child is given some amount of virtual cash, 25–50 cents, for each hour of good behavior. The same amount is subtracted from their accounts for breaking the rules. All purchases for fun—whether souvenirs, ice cream, or otherwise—come out of their own individual accounts. No balance, no goodies. This often requires more self-control on the part of the parents than the children.

How to Get Airfare at 50–80% Off

This is not a book on budget travel. Most of the cost-cutting recommendations found in such guides are designed with the binge traveler in mind. For someone embarking on a mini-retirement, an extra $150 for hassle-free airfare amortized over two months is a better deal than 20 hours of manipulating frequent-flier points on an unknown airline or chasing questionable deals.

Following two weeks of research, I once bought a one-way standby ticket to Europe for $120. I arrived at JFK brimming with enthusiasm and confidence—look at all these schmucks paying retail!—and 90% of the "participating" airlines refused my ticket. Those that didn't were booked for weeks solid. I ended up staying in a hotel for two nights for a $300 tab, filing a complaint with AMEX, and eventually calling 1–800-FLY-EUROPE from the JFK terminal in frustration. I bought a round-trip ticket to London on Virgin Atlantic for $300 and left an hour later. The same ticket cost more than $700 a week earlier.

After 25 countries, I've found a few simple strategies that get you 90% of the possible savings without wasting time or producing migraines.

1. Use credit cards with reward points for large muse-related advertising and manufacturing expenses.

I am not spending more money to get pennies on the dollar—these costs are inevitable, so I capitalize on them. This alone gets me a free round-trip international ticket each three months.

2. Purchase tickets far in advance (three months or more) or last minute, and aim for both departure and return between Tues day and Thursday.

   Long-term travel planning turns me off and can be expensive if plans change, so I opt for purchasing all tickets in the last four or five days prior to target departure. The value of empty seats is $0 as soon as the flight takes off, so true last-minute seats are cheap.

   Use Orbitz (www.orbitz.com) and www.kayak.com first. Fix the departure and return dates between Tuesday and Thursday. Then look at prices for alternative departure dates each of three days into the past and each of three days into the future. Using the cheapest departure date, do the same with the return dates to find the cheapest combination. Check this price against the fares on the website of the airline itself. Then begin bidding on www.priceline.com at 50% of the better of the two, working up in $50 increments until you get a better price or realize it's not possible.

3. Consider buying one ticket to an international hub and then an ongoing ticket with a cheap local airline.

   If going to Europe on a tight budget, you could get three tickets. One free Southwest ticket (from transferring AMEX points) from CA to JFK, the cheapest ticket to Heathrow in London, and then an übercheap ticket on either Ryanair or EasyJet to a final destination. I have paid as little as $10 to go from London to Berlin or London to Spain. That is not a typo. Local airlines will often offer seats on flights for just the cost of taxes and gasoline. To Central or South American destinations, I'll often look at local flights from Panama or international flights from Miami.

When More Is Less: Cutting the Clutter

> Human beings have the capacity to learn to want almost any conceivable material object. Given, then, the emergence of a modern industrial culture capable of producing almost anything, the time is ripe for opening the storehouse of infinite need! ... It is the modern Pandora's box, and its plagues are loose upon the world.
>
> —JULES HENRY

> To be free, to be happy and fruitful, can only be attained through sacrifice of many common but overestimated things
>
> —ROBERT HENRI

I know the son of one deca-millionaire, a personal friend of Bill Gates, who now manages private investments and ranches. He has accumulated an assortment of beautiful homes over the last decade, each with full-time cooks, servants, cleaners, and support staff. How does he feel about having a home in each time zone? It's a pain in the ass! He feels like he's working for his staff, who spend more time in his homes than he does.

Extended travel is the perfect excuse to reverse the damage of years of consuming as much as you can afford. It's time to get rid of clutter disguised as necessities before you drag a five-piece Samsonite set around the world. That is hell on earth.

I'm not going to tell you to walk around in a robe and sandals scowling at people who have televisions. I hate that kashi-crunching holier-than-thou stuff. Turning you into a possession-less scribe

is not my intention. Let's face it, though: There are tons of things in your home and life that you don't use, need, or even particularly want. They just came into your life as impulsive flotsam and jetsam and never found a good exit. Whether you're aware of it or not, this clutter creates indecision and distractions, consuming attention and making unfettered happiness a real chore. It is impossible to realize how distracting all the crap is—whether porcelain dolls, sports cars, or ragged T-shirts—until you get rid of it.

Prior to my 15-month trip, I was stressed about how to fit all of my belongings into a 14 **x** 10-foot rental storage space. Then I realized a few things: I would never reread the business magazines I'd saved, I wore the same five shirts and four pairs of pants 90% of the time, it was about time for new furniture, and I never used the outdoor grill or lawn furniture.

Even getting rid of things I *never* used proved to be like a capitalist short-circuit. It was hard to toss things I had once thought were valuable enough to spend money on. The first ten minutes of sorting through clothing was like choosing which child of mine should live or die. I hadn't exercised my throwing-out muscles in some time. It was a struggle to put nice Christmas clothing I'd never worn into the "go" pile and just as hard to separate myself from worn and ragged clothing I had for sentimental reasons. Once I'd passed through the first few tough decisions, though, the momentum had been built and it was a breeze. I donated all of the seldom-worn clothing to Goodwill. The furniture took less than 10 hours to offload using Craigslist, and though I was paid less than 50% of the retail prices for some and nothing for others, who cared? I'd used and abused them for five years and would get a new set when I landed back in the U.S. I gave the grill and lawn furniture to my friend, who lit up like a kid at Christmas. I had made his month. It felt wonderful and I had an extra $300 in pocket change to cover at least a few weeks of rent abroad.

I created 40% more space in my apartment and hadn't even grazed the surface. It wasn't the extra physical space that I felt most. It was the extra mental space. It was as if I had 20 mental applications running simultaneously before, and now I had just one or two. My thinking was clearer and I was much, much happier.

I asked every vagabond interviewee in this book what their one recommendation would be for first-time extended travelers. The answer was unanimous: Take less with you.

The overpacking impulse is hard to resist. The solution is to set what I call a "settling fund." Rather than pack for all contingencies, I bring the absolute minimum and allocate $100–300 for purchasing things after I arrive and as I travel. I no longer take toiletries or more than a week's worth of clothing. It's a blast. Finding shaving cream or a dress shirt overseas can produce an adventure in and of itself.

Pack as if you were coming back in one week. Here are the bare essentials, listed in order of importance:

1. *One week* of clothing appropriate to the season, including *one* semiformal shirt and pair of pants or skirt for customs. Think T-shirts, one pair of shorts, and a multipurpose pair of jeans.
2. Backup photocopies or scanned copies of all important documents: health insurance, passport/visa, credit cards, debit cards, etc.
3. Debit cards, credit cards, and $200 worth of small bills in local currency (traveler's checks are not accepted in most places and are a hassle)
4. Small cable bike lock for securing luggage while in transit or in hostels; a small padlock for lockers if needed
5. Electronic dictionaries for target languages (book versions are too slow to be of use in conversation) and small grammar guides or texts
6. One broad-strokes travel guide

That's it.[73] To laptop or not to laptop? Unless you are a writer, I vote no. It's far too cumbersome and distracting. Using GoToMyPC to access your home computer from Internet cafés encourages the habit we want to develop: making the best use of time instead of killing it.

The Bora-Bora Dealmaker

BAFFIN ISLAND, NUNAVUT

Josh Steinitz[74] stood at the edge of the world and stared in amazement. He dug his boots into the six feet of sea ice and the unicorns danced.

Ten narwhals—rare cousins of the beluga—came to the surface and pointed their six-foot-plus spiral tusks toward the heavens. The pod of 3,000-pound whales then fell into the depths once again. The narwhals are deep divers—more than 3,000 feet in some cases—so Josh had at least 20 minutes until their reappearance.

It seemed appropriate that he was with the narwhals. Their name came from Old Norse and referred to their mottled white and blue skin.

Náhvalr—corpse man.

He smiled as he had done often in the last few years. Josh himself was a dead man walking.

One year after graduating from college, Josh found out that he had oral squamous carcinoma—cancer. He had plans to be a management consultant. He had plans to be lots of things. Suddenly none of it mattered. Less than half of those who suffered from this particular type of cancer survived.[75] The reaper didn't discriminate and came without warning.

It became clear that the biggest risk in life wasn't making mistakes but regret: missing out on things. He could never go back and recapture years spent doing something he disliked.

Two years later and cancer-free, Josh set off on an indefinite global walkabout, covering expenses as a freelance writer. He later became the cofounder of a website that provides customized itineraries to would-be vagabonds. His executive status didn't lessen his mobile addiction. He was as comfortable cutting deals from the over-water bungalows of Bora-Bora as he was in the log cabins of the Swiss Alps.

He once took a call from a client while at Camp Muir on Mt. Rainier. The client needed to confirm some sales numbers and asked Josh about all the wind in the background. Josh's answer: "I'm standing at 10,000 feet on a glacier and this afternoon the wind is whipping us down the mountain." The client said he'd let Josh get back to what he was doing.

Another client called Josh while he was leaving a Balinese temple and heard the gongs in the background. The client asked Josh if he was in church. Josh wasn't quite sure what to say. All that came out was, "Yes?"

Back among the narwhals, Josh had a few minutes before heading to base camp to avoid polar bears. Twenty-four-hour daylight meant that he had much to share with his friends back in the land of cubicles. He sat down on the ice and produced his satellite phone and laptop from a waterproof bag. He began his e-mail in the usual way:

"I know you're all sick of seeing me have so much fun, but guess where I am?"

► Q&A: QUESTIONS AND ACTIONS

> It is fatal to know too much at the outcome: boredom comes as quickly to the traveler who knows his route as to the novelist who is overcertain of his plot.
>
> —PAUL THEROUX, *To the Ends of the Earth*

If this is your first time considering a commitment to the mobile lifestyle and long-term adventuring, I envy you! Making the jump and entering the new worlds that await is like upgrading your role in life from passenger to pilot.

The bulk of this Q&A will focus on the precise steps that you should take—and the countdown timeline you can use—when preparing for your first mini-retirement. Most steps can be eliminated or condensed once you get one trip under your belt. Some of the steps are one-time events, after which subsequent mini-retirements will require a maximum of two to three weeks of preparation. It now takes me three afternoons.

Grab a pencil and paper—this will be fun.

1. **Take an asset and cash-flow snapshot**.
Set two sheets of paper on a table. Use one to record all assets and corresponding values, including bank accounts, retirement accounts, stocks, bonds, home, and so forth. On the second, draw a line down the middle and write down all incoming cash flow (salary, muse income, investment income, etc.) and outgoing expenses (mortgage, rent, car payments, etc.). What can you eliminate that is either seldom used or that creates stress or distraction without adding a lot of value?

2. **Fear-set a one-year mini-retirement in a dream location in Europe**.
Use the questions from chapter 3 to evaluate your worst-case-scenario fears and evaluate the real potential consequences. Except in rare cases, most will be avoidable and the rest will be reversible.

3. **Choose a location for your actual mini-retirement. Where to start?**
This is the big question. There are two options that I advocate:

1. Choose a starting point and then wander until you find your second home. This is what I did with a one-way ticket to London, vagabonding throughout Europe until I fell in love with Berlin, where I remained for three months.
2. Scout a region and then settle in your favorite spot. This is what I did with a tour of Central and South America, where I spent one to four weeks in each of several cities, after which I returned to my favorite—Buenos Aires—for six months.

It is possible to take a mini-retirement in your own country, but the transformative effect is hampered if you are surrounded by people who carry the same socially reinforced baggage.

I recommend choosing an overseas location that will seem foreign but that isn't dangerous. I box, race motorcycles, and do all sorts of macho things, but I draw the line at *favelas*,[76] civilians with machine guns, pedestrians with machetes, and social strife. Cheap is good, but bullet holes are bad. Check the U.S. Department of State for travel warnings before booking tickets (http:// travel.state.gov).

Here are just a few of my favorite starting points. Feel free to choose other locations. The most lifestyle for the dollar is underlined: Argentina (Buenos Aires, Córdoba), China (Shanghai, Hong Kong, Taipei), Japan (Tokyo, Osaka), England (London), Ireland (Galway), Thailand (Bangkok, Chiang Mai), Germany (Berlin, Munich), Norway (Oslo), Australia (Sydney), New Zealand (Queenstown), Italy

(Rome, Milan, Florence), Spain (Madrid, Valencia, Sevilla), and Holland (Amsterdam). In all of these places, it is possible to live well while spending little. I spend less in Tokyo than in California because I know it well. Hip, recently gentrified artist areas, not unlike the Brooklyn of 10 years ago, can be found in almost all cities. The one place I can't seem to find a decent lunch for less than $20 U.S.? London.

Here are a few exotic places I don't recommend for vagabonding virgins, though veterans can make them all work: all countries in Africa, the Middle East, or Central and South America (excepting Costa Rica and Argentina). Mexico City and Mexican border areas are also a bit too kidnap-happy to make it onto my favorites list.

4. **Prepare for your trip. Here's the countdown**.

► Three months out—Eliminate

Get used to minimalism before the departure. Here are the questions to ask and act upon, even if you never plan to leave:

What is the 20% of my belongings that I use 80% of the time? Eliminate the other 80% in clothing, magazines, books, and all else. Be ruthless—you can always repurchase things you can't live without.

Which belongings create stress in my life? This could relate to maintenance costs (money and energy), insurance, monthly expenses, time consumption, or simple distraction. Eliminate, eliminate, eliminate. If you sell even a few expensive items, it could finance a good portion of your mini-retirement. Don't rule out the car and home. It's always possible to purchase either upon your return, often losing no money in the process.

Check current health insurance coverage for extended overseas travel. Get the wheels in motion to rent, swap, or sell your home—renting out is most recommended by serial vagabonds—or end your apartment lease and move all belongings into storage.

In all cases where doubts crop up, ask yourself, "If I had a gun to my head and had to do it, how would I do it?" It's not as hard as you think.

► Two months out—Automate

After eliminating the excess, contact companies (including suppliers) that bill you regularly and set up autopayment with credit cards that have reward points. Telling them that you will be traveling the world for a year often persuades them to accept credit cards rather than chase you around the planet like Carmen Sandiego.

For the credit card companies themselves and others that refuse, arrange automatic debit from your checking account. Set up online banking and bill payment. Set up all companies that won't take credit cards or automatic debit as online payees. Set these scheduled checks for $15–20 more than expected when dealing with utilities and other variable expenses. This will cover miscellaneous fees, prevent time-consuming billing problems, and accrue as a credit. Cancel paper bank and credit card statement delivery. Get bank-issued *credit* cards for all checking accounts—generally one for business and one for personal—and set the cash advances to $0 to minimize abuse potential. Leave these cards at home, as they are just for emergency overdraft protection.

Give a trusted member of your family and/or your accountant power of attorney,[77] which gives that person authority to sign documents (tax filings and checks, for example) in your name. Nothing screws

up foreign fun faster than having to sign original documents when faxes are unacceptable.

► One month out—

Speak to the manager of your local post office and have all mail forwarded to a friend, family member, or personal assistant,[78] who will be paid $100–200 per month to e-mail you brief descriptions of all nonjunk mail each Monday.

Get all required and recommended immunizations and vaccinations for your target region. Check the Centers for Disease Control and Prevention (www.cdc.gov/travel/). Note that proof of immunizations is sometimes required to pass through foreign customs.

Set up a trial account with GoToMyPC or similar remote-access software and take a dry run to ensure that there are no technological glitches.[79]

If resellers (or distributors) still send you checks—the fulfillment house should handle customer checks at this point—do one of three things: give the resellers direct bank deposit information (ideal), have the fulfillment house handle these checks (second choice), or have the resellers pay via PayPal or mail checks to one of the people you are trusting with power of attorney (far third). In the last case, give the person with power of attorney deposit slips so he or she can sign or stamp and mail in the checks. It is convenient to become a member of a large bank (Bank of America, Wells Fargo, Washington Mutual, Citibank, etc.) with branches near the person assisting you so that they can drop off the deposits while running other errands. No need to move all accounts to this bank if you don't want to; just open a single new account that is used solely for these deposits.

► Two weeks out—

Scan all identification, health insurance, and credit/debit cards into a computer from which you can print multiple copies, several to be left with family members and several to be taken with you in separate bags. E-mail the scanned file to yourself so that you can access it while abroad if you lose the paper copies.

If you are an entrepreneur, downgrade your cell phone to the cheapest plan and set up a voicemail greeting that states, "I am currently overseas on business. Please do not leave a voicemail, as I will not be checking it while gone. Please send me an e-mail at __@__.com if the matter is important. Thank you for your understanding." Then set up e-mail autoresponders that indicate responses could take up to seven days (or whatever you decide for frequency) due to international business travel.

If you are an employee, consider getting a quad-band or GSM-compatible cell phone so that the boss can contact you. Get a BlackBerry only if your boss will be checking to see if you are working via e-mail. Be sure to disable the dead giveaway "Sent from a BlackBerry" signature on outgoing e-mail! Other options include using a SkypeIn account that forwards to your foreign cell phone (my preference) or a Vonage IP box that allows you to receive landline calls anywhere in the world via a phone number that begins with your home area code.

Find an apartment for your ultimate mini-retirement destination or reserve a hostel or hotel at your starting point for three to four days. Reserving an apartment before you arrive is riskier and will be much more expensive than using the latter three to four days to find an apartment. I recommend hostels for the starting point if possible—not for cost considerations but because the staff and fellow travelers are more knowledgeable and helpful with relocations.

Get foreign medical evacuation insurance if needed for peace of mind. This tends to be redundant if

you are in a first-world country and can buy local insurance to augment your own, which I do, and it is useless if you are a 10-hour flight from civilization. I had evacuation insurance in Panama, as it's a 2-hour flight from Miami, but I didn't bother elsewhere. Don't freak out about this; it's just as true if you're in the middle of nowhere in the middle of the U.S.

► One week out—

Decide on a schedule for routine batched tasks such as e-mail, online banking, etc. to eliminate excuses for senseless pseudo-work procrasterbating. I suggest Monday mornings for checking e-mail and online banking. The first and third Mondays of the month can be used for checking credit cards and making other online payments such as affiliates. These promises to yourself will be the hardest to keep, so make a commitment now and expect serious withdrawal cravings.

Save important documents—including the scan of your identification, insurance, and credit/debit cards —to a small handheld storage device that plugs into a computer USB port.

Move all things out of your home or apartment into storage, pack a single small backpack and carry-on bag for the adventure, and move in briefly with a family member or friend.

► Two days out—

Put remaining automobiles into storage or a friend's garage. Put fuel stabilizer like Sta-Bil® in the gas tanks, disconnect the negative leads from batteries to prevent drain, and put the vehicles on jack stands to prevent tire and shock damage. Cancel all auto insurance except for theft coverage.

► Upon arrival (assuming you have not booked an apartment in advance)—

First morning and afternoon after check-in Take a hop-on-hop-off bus tour of the city followed by a bike tour of potential apartment neighborhoods.

First late afternoon or evening Purchase an unlocked[80] cell phone with a SIM card that can be recharged with simple prepaid cards. E-mail apartment owners or brokers on Craigslist.com and online versions of local newspapers for viewings over the next two days.

Second and third days Find and book an apartment for one month. Don't commit to more than one month until you've slept there. I once prepaid two months only to find that the busiest bus stop downtown was on the other side of my bedroom wall.

Move-in day Get settled and purchase local health insurance. Ask hostel owners and other locals what insurance they use. Resolve not to buy souvenirs or other take-home items until two weeks prior to departure.

One week later Eliminate all the extra crap you brought but won't use often. Either give it to someone who needs it more, mail it back to the U.S., or throw it out.

► TOOLS AND TRICKS

► Virtual Tourist (www.virtualtourist.com)

The single largest source of unbiased, user-generated travel content in the world. More than 1,000,000 members contribute tips and warnings for more than 25,000 locations. Each location is covered in 13 separate categories, including Things to Do, Local Customs, Shopping, and Tourist Traps. This is one-stop shopping for most mini-retirements.

► Escape Artist (www.escapeartist.com)

Interested in second passports, starting your own country, Swiss banking, and all the other things I wouldn't dare put in this book? This site is a fantastic resource. Drop me a note from the Caymans or jail, whichever comes first. Also search "How to Be Jason Bourne" at www.fourhourblog.com.

► Outside Magazine Online Free Archives (http://outside.away.com)

The entire archive of *Outside* magazine available online for free. From meditation camps to worldwide adrenaline hotspots, dream jobs to Patagonia winter highlights, there are hundreds of articles with beautiful photos to give you the walkabout itch.

► GridSkipper: The Urban Travel Guide (www.gridskipper.com)

For those who love *Blade Runner*-like settings and exploring the cool nooks and crannies of cities worldwide, this is the site. It is one of *Forbes's* Top 13 Travel sites and is "high-falootin' and low-brow all in the same breath" *(Frommer's)*. Translation: Much of the content is not G-rated. If four-letter words or a "world's sluttiest city" poll bother you, don't bother visiting this site (or Rio de Janeiro, for that matter). Otherwise, check out the hysterical writing and "$100 a day" info for cities worldwide.

► Lonely Planet: The Thorn Tree (http://thorntree.lonelyplanet.com)

Discussion forum for global travelers with threads separated by region.

► Family Travel Forum (www.familytravelforum.com)

A comprehensive forum on, you guessed it, family travel. Want to sell your kids for top dollar in the Eastern Bloc? Or save a few dollars and cremate Grannie in Thailand? Then this isn't the site. But if you have kids and are planning a big trip, this is the place.

► **U.S. Department of State Country Profiles (www.state.gov/r/pa/ei/bgn/)**

►**World Travel Watch (www.worldtravelwatch.com)**

Larry Habegger and James O'Reilly's weekly online report of global events and odd happenings relevant to travel safety, sorted by topic and geographic region. Concise and a must-see prior to finalizing plans.

► **U.S. Department of State Worldwide Travel Warnings (http://travel.state.gov)**

Mini-Retirement Planning and Preparation—Fundamentals

► **Round-the-World FAQ (includes travel insurance) (www.perpetualtravel.com/rtw)**

This FAQ is a lifesaver. Originally written by Marc Brosius, it has been added to by newsgroup participants for years and now covers nuts and bolts from financial planning to return culture shock and all in between. How long can you afford to be away? Do you need travel insurance? Leave of absence or resignation? This is an around-the-world almanac.

► **Removing Clutter: 1–800-GOT-JUNK (www.1800gotjunk.com), Freecycle (www.freecycle.org), and Craigslist (www.craigslist.org)**

I used Craigslist's "Free" category to get rid of four years of accumulated possessions in less than three hours on a Saturday evening. There were some for-sale items that I also cleared out at 30–40% of original retail. I then hauled off the last remaining items using the überfast 1–800-GOT-JUNK paid service. Freecycle is comparable to Craigslist for giving away, and getting, things for free when you're short on time. Get unattached and you'll make it a habit. I purge every 6–9 months, often including donations to Goodwill (www.goodwill.org), which can do pickups for free with advanced notice.

► **One-Bag: The Art and Science of Packing Light (www.onebag.com)**

One of *PC* magazine's "Top 100 [Can't Live Without] Sites." Pack light and experience lightness of being.

► **U.S. Centers for Disease Control and Prevention (www.cdc.gov/travel)**

Recommended vaccinations and health planning for every nation in the world. Certain countries require proof of inoculations to pass through customs. Get the shots well ahead of time, as some take weeks to order.

► **Tax Planning (www.irs.gov/publications/p54/index.html)**

More good news. Even if you permanently relocate to another country, you will have to pay U.S. taxes as long as you have a U.S. passport! Not to fret—there are some creative legal sidesteps, such as form 2555-EZ, which can provide up to an $85,700 income exemption if you spend at least 330 days of a consecutive 365 days off U.S. soil. This means you have 35 days in a given 12-month period to spend in the U.S. as you like, but no more. That's part of the reason my 2004 trip extended to 15 months. Get a good accountant and let them do the detail work to keep yourself out of trouble.

► **U.S.-Sponsored Overseas Schools (www.state.gov/m/a/os)**

If the idea of pulling your children out of school for a year or two isn't appealing, stick them in one of more than 190 elementary and secondary schools sponsored by the U.S. Department of State in 135 countries. Kids love home work.

► **Homeschooling 101 and Quickstart Guide (http://bit.ly/homeschooling101)**

This subsection of http://homeschooling.about.com/provides a step-by-step process for considering homeschooling options that can be applied to education during extended travel. Children can often return to traditional public or private schools ahead of their classmates.

►***Home Education*** **Magazine (www.homeedmag.com)** Rich collection of resources for homeschoolers, traveling families, and unschoolers. Links include curriculum, virtual support groups, legal resources, and archives. Good reasons to learn the law: Some U.S. states offer up to $1,600 of funding per year for qualified homeschooling expenditures, as it saves the state money to not educate your child in the public school system.

► **Universal Currency Converter (www.xe.com)**

Before you get caught up in the excitement and forget that five British pounds does not equal five U.S. dollars, use this to translate local costs into numbers you understand. Try not to have too many "Those coins are each worth four dollars?" moments.

► **Universal Plug Adapter (www.franzus.com)**

Carrying bulky cables and connectors is irritating—get a Travel Smart all-in-one adapter with surge protection. The size of a pack of cards folded in half, it is the only adapter that I've used everywhere without problems. Note that it is an adapter (helps you plug things in), but it is *not a transformer*. If the foreign wall outlet has twice as much voltage as in the U.S., your gadgets will self-destruct. Yet another reason to purchase necessities abroad instead of taking them all with you.

► **World Electric Guide (www.kropla.com)**

Figure out outlets, voltage, mobile phones, international dialing codes, and all sorts of things related to electric mismatching worldwide.

Cheap and Round-the-World Airfare

►**Orbitz (www.orbitz.com), Kayak (www.kayak.com)**, and **Sidestep (www.sidestep.com)**

Search 400+ airlines worldwide for each service. Orbitz is my starting point for pricing comparisons, after which I check both Kayak and Sidestep. Sidestep has proven most effective when searching for flights that start and end outside of the U.S.

► **TravelZoo Top 20 (http://top20.travelzoo.com /)**

Moscow for $129 one-way? These last-minute weekly travel specials might be the push you need to pull the trigger.

► **Priceline (www.priceline.com)**

Start bidding at 50% of the lowest Orbitz fare and move up in $50 increments.

► **CFares (www.cfares.com)**

Consolidator fares with free and low-cost memberships. I found a round-trip ticket from California to Japan for $500.

► **1–800-FLY-EUROPE (www.1800flyeurope.com)**

I used this to get the $300 roundtrip from JFK to London that left two hours later.

► **Discount Airlines for Flights within Europe (www.ryanair.com , www.easyjet.com)**

Free Worldwide Housing—Short Term

► **Global Freeloaders (www.globalfreeloaders.com)**

This online community brings people together to offer you free accommodation all over the world. Save

money and make new friends while seeing the world from a local's perspective.

► **The Couchsurfing Project (www.couchsurfing.com)**

Similar to the above but tends to attract a younger, more party-hearty crowd.

► **Hospitality Club (www.hospitalityclub.org)**

Meet locals worldwide who can provide free tours or housing through this well-run network of more than 200,000 members in 200+ countries.

Free Worldwide Housing—Long Term

►**Home Exchange International (www.homeexchange.com)** This is a home exchange listing and search service with more than 12,000 listings in more than 85 countries. E-mail directly owners of potential homes, put your own home/apartment on the site, and have unlimited access to view listings for one year for a small membership fee.

Paid Housing—from Arrival to the Long Haul

► **Otalo (www.otalo.com)**

Otalo is a search engine for vacation rentals that searches across the Internet's many different vacation rentals sites and 200,000+ homes. Otalo is like a Kayak.com for vacation rentals. The site scours a variety of other rental search sites and aggregates the results in one easy-to-use search tool.

► **Hostels.com (www.hostels.com)**

This site isn't just for youth hostels. I found a nice hotel in downtown Tokyo for $20 per night and have used this site for similar housing in eight countries. Think location and reviews (see HotelChatter next) instead of amenities. Four-star hotels are for binge travelers; this site can offer a real local flavor before you find an apartment or other longer-term housing.

► **HotelChatter (www.hotelchatter.com)**

Get the real scoop on this daily web journal with detailed and honest reviews of housing worldwide. Updated several times daily, this site offers the stories of frustrated guests and those who have found hidden gems. Online booking is available.

► **Craigslist (www.craigslist.org)**

Besides local weekly magazines with housing listings, such as *Bild* or *Zitty* (no joke) in Berlin, I have found Craigslist to be the single best starting point for long-term overseas furnished apartments. As of this writing, there are more than 50 countries represented. That said, prices will be 30–70% less in the local magazines—if you have a tight budget, get a hostel employee or other local to help you make a few calls and strike a deal. Ask the local helper not to mention you're a foreigner until pricing is agreed upon.

► **Interhome International (www.interhome.com)**

Based in Zurich, more than 20,000 homes for rent in Europe.

► **Rentvillas.com (www.rentvillas.com)**

Provides unique renting experiences—from cottages and farmhouses to castles—throughout Europe, including France, Italy, Greece, Spain, and Portugal.

Computer Remote Access and Backup Tools

► **GoToMyPC (www.gotomypc.com)**

This software facilitates quick and easy remote access to your computer's files, programs, e-mail, and network. It can be used from any web browser or wireless device and works in real time. I have used GoToMyPC religiously for more than five years to access my U.S.-based computers from countries and islands worldwide. This gives me the freedom to leave all computers at home.

► **WebExPCNow (http://pcnow.webex.com)**

WebEx, the leader in corporate remote access, now offers software that does most of what GoToMyPC offers, including cut and paste between remote computers, local printing from remote computers, file transfers, and more.

►**DropBox (www.getdropbox.com)** and **SugarSync (www.sugarsync.com);** then **JungleDisk (www.jungledisk.com)** and **Mozy (www.mozy.com)** Both DropBox and SugarSync perform backups and synching of files between multiple computers (home and travel computers, for example). JungleDisk and Mozy—I use the latter—have fewer features and are more specifically designed for automatic backups to their online storage.

Free and Low-Cost Internet (IP) Telephones

► **Skype (www.skype.com)**

Skype is my default for all phone calls. It allows you to call landlines and mobile phones across the globe for an average of 2–5 cents per minute, or connect with other Skype users worldwide for free. For about 40 euros per year, you can get a U.S. number with your home area code and receive calls that forward to a foreign cell phone. This makes your travel invisible. Lounge on the beach in Rio and answer calls to your "office" in California. Nice. Skype Chat, which comes with the service, is also perfect for sharing sensitive log-in and password information with others, as it's encrypted.

►**Vonage (www.vonage.com)** and **Ooma (www.ooma.com)**

Vonage offers a small adapter for a monthly fee that connects your broadband modem to a normal phone. Take it on your travels and set it up in your apartment to receive calls to a U.S. number. Ooma has no monthly fees and doesn't require a landline, but it offers similar hardware you can connect to broadband for a local U.S. number anywhere in the world.

►**VoIPBuster (www.voipbuster.com)** and **RebTel (www.rebtel.com)**

Both VoIPBuster and RebTel can provide "alias" numbers. Enter a friend's overseas number on their sites, and both will give you a local number in your area code that will forward to your friend. VoIPBuster also acts as a cheaper Skype with free calls to more than 20 countries.

International Multi-Band and GSM-Compatible Phones

► **My World Phone (www.myworldphone.com)**

I'm partial to Nokia phones. Ensure whichever phone you purchase is "unlocked"—that the SIM card can be swapped out in different countries with different providers.

► **World Electronics USA (www.worldelectronicsusa.com)**

Good explanation of which GSM frequencies and "bands" function in which countries, which will determine which phone you purchase for travel (and perhaps home).

Tools for Off-the-Beaten Path

► **Satellite Phones (www.satphonestore.com)**

If you will be in the mountains of Nepal or on a remote island and want the peace of mind (or headache) of having a phone nearby, these phones work via satellite instead of towers. Iridium has been

recommended for widest reception (pole to pole), with GlobalStar in second place (three continents). Rent or purchase.

► **Pocket-size Solar Panels (www.solio.com)**

Satellite phones and other small electronics are of little use (skipping stones, perhaps?) if their batteries die. Solio is about the size of two packs of cards and fans out into small solar panels. I was surprised to find that it charged my cell phone in less than 15 minutes—more than twice as fast as a wall outlet. Adapters are available for almost anything.

What to Do Once You Get There—Career Experiments and More

►*Verge Magazine* **(see Restricted Reading appendix)**

► **Meet Up (www.meetup.com)**

Search by city and activity to find people who share similar interests all over the world.

► **Become a Travel Writer (www.writtenroad.com)**

Get paid to travel the world and record your thoughts? This is a dream job for millions. Get the inside scoop on the travel publishing world from veteran Jen Leo, author of *Sand in My Bra and Other Misadventures: Funny Women Write from the Road*. This blog was a *Frommer's Budget Travel* Top Choice and also features great practical articles about low-tech travel and going gadgetless.

► **Teach Engrish (www.eslcafe.com)**

Dave's ESL Café is one of the oldest and most useful resources for teachers, would-be teachers, and learners of English. Features discussion boards and "teachers wanted" job postings worldwide.

► **Turn Your Brain into Play-Doh (www.jiwire.com)**

Travel the world so you can instant message (IM) with your friends in the U.S. This site lists more than 150,000 hotspots where you can feed your information OCD. Be ashamed if this becomes your default activity. If you're bored, just remember—it's your fault. I've been there, so I'm not preaching. It happens to the best of us from time to time, but get more creative.

► **Test a New Career Part- or Full-Time: Working Overseas (www.workingoverseas.com)**

This encyclopedia is an exhaustive menu of options for the globally minded, compiled and updated by

Jean-Marc Hachey, former international careers editor of *Transitions Abroad* magazine.

► **World Wide Opportunities on Organic Farms (www.wwoof.com)**

Learn and then teach sustainable organic farming techniques in dozens of countries, including Turkey, New Zealand, Norway, and French Polynesia.

Chat and E-mail in a Language You Don't Know

► **Google Chat Bots (http://bit.ly/imbot)**

Use this to chat in real time using almost any language. Instant message (IM) directly from your Gmail e-mail account with anyone in the world.

►**Nice Translator (www.nicetranslator.com)** and **Free Translation (www.freetranslation.com)**

Translate text from English into a dozen languages and vice versa. Surprisingly accurate, though the lost-in-translation 10–20% can get you in trouble. Nice Translator is faster and can be used on the iPhone.

Become Fluent in Record Time

Language Addicts and Accelerated Learning

For all things language related, from detailed how-to articles (how to reactivate forgotten languages, memorize 1,000 words per week, master tones, etc.) to mnemonics and the best electronic shortcuts, click on "language" at www.fourhourblog.com. Learning languages is an addiction of mine and a skill I have taken apart and reassembled to be faster. It is possible to become conversationally fluent in any language in 3–6 months.

Find Language Exchange Partners and Materials

► **LiveMocha (www.livemocha.com),**

EduFire (www.edufire.com), and

Smart.fm (http://smart.fm/)

I particularly like their BrainSpeed learning game.

► **About.com (www.about.com)**

Some of the more popular languages have excellent tutorials on About.com:

http://italian.about.com

http://spanish.about.com
http://german.about.com
http://french.about.com

68. The dollar figures in this chapter are all from a period immediately following President Bush's reelection in 2004, which correlated to the worst dollar exchange rates of the last 20 years.

69. I refer, of course, to the amazing bike-riding opportunities and famous pastries.

70. Coined by Joel Stein of the *LA Times*.

71. By all means, go ahead and take a post-office celebratory trip and go nuts for a few weeks. I know I did. Rock on. Ibiza and glow sticks here I come. Have some absinthe and drink lots of water. Following that, sit down and plan an introspective mini-retirement.

72. Muses are low maintenance but often expensive in one or both of two tactical areas: manufacturing and advertising. Shop for providers of both that are willing to accept credit cards as payment, and negotiate this up front if necessary by saying, "Rather than trying to negotiate you down on pricing, I just ask that you accept payment by credit card. If you can do that, we'll choose you over Competitor X." This is yet another example of a "firm offer," and not a question, that puts you in a stronger negotiating position. For a detailed explanation of how I multiply points for travel using concepts like "piggybacking" and "recycling," search for both terms on www.fourhourblog.com.

73. To see a video of how I pack to travel the world with less than 10 pounds, click on "travel" at www.fourhourblog.com.

74. Founder of www.nileproject.com.

75. http://www.usc.edu/hsc/dental/opfs/SC/indexSC.html.

76. Brazilian shantytowns. See the movie *City of God (Cidade de Deus)* to get a taste of how fun these are.

77. This is a serious step and should not be taken with those you do not trust. In this case, it helps because your accountant can then sign tax documents or checks in your name instead of consuming hours and days of your time with faxes, scanners, and expensive international FedEx'ing of documents.

78. There are also services like www.earthclassmail.com, which will receive, scan, and e-mail all of your non-junk mail to you as PDFs.

79. This would be used if you leave your computer at home or in someone else's home while traveling. This step can be skipped if you bring your computer, but that is like a recovering heroin addict bringing a bag of opium to rehab. Don't tempt yourself to kill time instead of rediscovering it.

80. "Unlocked" means that it is recharged with prepaid cards instead of being on a monthly payment plan with a single carrier such as O2 or Vodafone. This also means that the same phone can be used with carriers in other countries (assuming the frequency is the same) with a simple switch of the SIM memory card for $10–30 U.S. in most cases. Some U.S.-compatible quad-band phones can use SIM cards.

15
Filling the Void

To be engrossed by something outside ourselves is a powerful antidote for the rational mind, the mind that so frequently has its head up its own ass.

—ANNE LAMOTT, *Bird by Bird*

There is not enough time to do all the nothing we want to do.

—BILL WATTERSON, creator of the Calvin and Hobbes cartoon strip

KING'S CROSS , LONDON

I stumbled into the deli across the cobblestone street and ordered a prosciutto sandwich. It was 10:33 A.M. now, the fifth time I'd checked the time, and the twentieth time I'd asked myself, "What the &%$# am I going to do today?"

The best answer I had come up with so far was: get a sandwich.

Thirty minutes earlier, I had woken up without an alarm clock for the first time in four years, fresh off arriving from JFK the night before. I had soooo been looking forward to it: awakening to musical birdsong outside, sitting up in bed with a smile, smelling the aroma of freshly brewed coffee, and stretching out overhead like a cat in the shade of a Spanish villa. Magnificent. It turned out more like this: bolt upright as if blasted with a foghorn, grab clock, curse, jump out of bed in underwear to check e-mail, remember that I was forbidden to do so, curse again, look for my host and former classmate, realize that he was off to work like the rest of the world, and proceed to have a panic attack.

I spent the rest of the day in a haze, wandering from museum to botanical garden to museum as if on rinse and repeat, avoiding Internet cafés with some vague sense of guilt. I needed a to-do list to feel productive and so put down things like "eat dinner."

This was going to be a lot harder than I had thought.

Postpartum Depression: It's Normal

Man is so made that he can only find relaxation from one kind of labor by taking up another.

—ANATOLE FRANCE, author of *The Crime of Sylvestre Bonnard*

I've Got More Money and Time Than I Ever Dreamed Possible … Why Am I Depressed?

It's a good question with a good answer. Just be glad you're figuring this out now and not at the end of life! The retired and ultrarich are often unfulfilled and neurotic for the same reason: too much idle time.

But wait a second … Isn't more time what we're after? Isn't that what this book is all about? No, not at all. Too much free time is no more than fertilizer for self-doubt and assorted mental tail-chasing. Subtracting the bad does not create the good. It leaves a vacuum. Decreasing income-driven work isn't

the end goal. Living more—and becoming more—is.

In the beginning, the external fantasies will be enough, and there is nothing wrong with this. I cannot overemphasize the importance of this period. Go nuts and live your dreams. This is not superficial or selfish. It is critical to stop repressing yourself and get out of the postponement habit.

Let's suppose you decide to dip your toe in dreams like relocating to the Caribbean for island-hopping or taking a safari in the Serengeti. It will be wonderful and unforgettable, and you should do it. There will come a time, however—be it three weeks or three years later—when you won't be able to drink another piña colada or photograph another damn red-assed baboon. Self-criticism and existential panic attacks start around this time.

But This Is What I Always Wanted! How Can I Be Bored?!

Don't freak out and fuel the fire. This is normal among all high-performers who downshift after working hard for a long time. The smarter and more goal-oriented you are, the tougher these growing pains will be. Learning to replace the perception of time famine with appreciation of time abundance is like going from triple espressos to decaf.

But there's more! Retirees get depressed for a second reason, and you will too: social isolation.

Offices are good for some things: free bad coffee and complaining thereof, gossip and commiserating, stupid video clips via e-mail with even stupider comments, and meetings that accomplish nothing but kill a few hours with a few laughs. The job itself might be a dead end, but it's the web of human interactions —the social environment—that keeps us there. Once liberated, this automatic tribal unit disappears, which makes the voices in your head louder.

Don't be afraid of the existential or social challenges. Freedom is like a new sport. In the beginning, the sheer newness of it is exciting enough to keep things interesting at all times. Once you have learned the basics, though, it becomes clear that to be even a half-decent player requires some serious practice.

Don't fret. The greatest rewards are to come, and you're 10 feet from the finish line.

Frustrations and Doubts: You're Not Alone

> People say that what we are seeking is a meaning for life. I don't think this is what we're really seeking. I think what we're seeking is an experience of being alive.
>
> —JOSEPH CAMPBELL, *The Power of Myth*

Once you eliminate the 9–5 and the rubber hits the road, it's not all roses and white-sand bliss, though much of it can be. Without the distraction of deadlines and co-workers, the big questions (such as "What does it all mean?") become harder to fend off for a later time. In a sea of infinite options, decisions also become harder—What the hell should I do with my life? It's like senior year in college all over again.

Like all innovators ahead of the curve, you will have frightening moments of doubt. Once past the kid-in-a-candy-store phase, the comparative impulse will creep in. The rest of the world will continue with its 9–5 grind, and you'll begin to question your decision to step off the treadmill. Common doubts and self-flagellation include the following:

1. Am I really doing this to be more free and lead a better life, or am I just lazy?

2. Did I quit the rat race because it's bad, or just because I couldn't hack it? Did I just cop out?
3. Is this as good as it gets? Perhaps I was better off when I was following orders and ignorant of the possibilities. It was easier at least.
4. Am I really successful or just kidding myself?
5. Have I lowered my standards to make myself a winner? Are my friends, who are now making twice as much as three years ago, really on the right track?
6. Why am I not happy? I can do anything and I'm still not happy. Do I even deserve it?

Most of this can be overcome as soon as we recognize it for what it is: outdated comparisons using the more-is-better and money-as-success mind-sets that got us into trouble to begin with. Even so, there is a more profound observation to be made.

These doubts invade the mind when nothing else fills it. Think of a time when you felt 100% alive and undistracted—in the zone. Chances are that it was when you were completely focused in the moment on something external: someone or something else. Sports and sex are two great examples. Lacking an external focus, the mind turns inward on itself and creates problems to solve, even if the problems are undefined or unimportant. If you find a focus, an ambitious goal that seems impossible and forces you to grow,[81] these doubts disappear.

In the process of searching for a new focus, it is almost inevitable that the "big" questions will creep in. There is pressure from pseudo-philosophers everywhere to cast aside the impertinent and answer the eternal. Two popular examples are "What is the meaning of life?" and "What is the point of it all?"

There are many more, ranging from the introspective to the ontological, but I have one answer for almost all of them—I don't answer them at all.

I'm no nihilist. In fact, I've spent more than a decade investigating the mind and concept of meaning, a quest that has taken me from the neuroscience laboratories of top universities to the halls of religious institutions worldwide. The conclusion after it all is surprising.

I am 100% convinced that most big questions we feel compelled to face—handed down through centuries of overthinking and mistranslation—use terms so undefined as to make attempting to answer them a complete waste of time.[82] This isn't depressing. It's liberating.

Consider the question of questions: What is the meaning of life?

If pressed, I have but one response: It is the characteristic state or condition of a living organism. "But that's just a definition," the questioner will retort, "that's not what I mean at all." What do you mean, then? Until the question is clear—each term in it defined—there is no point in answering it. The "meaning" of "life" question is unanswerable without further elaboration.

Before spending time on a stress-inducing question, big or otherwise, ensure that the answer is "yes" to the following two questions:

1. Have I decided on a single meaning for each term in this question?
2. Can an answer to this question be acted upon to improve things?

"What is the meaning of life?" fails the first and thus the second. Questions about things beyond your sphere of influence like "What if the train is late tomorrow?" fail the second and should thus be ignored. These are not worthwhile questions. **If you can't define it or act upon it, forget it**. If you take just this point from this book, it will put you in the top 1% of performers in the world and keep most philosophical distress out of your life.

Sharpening your logical and practical mental toolbox is *not* being an atheist or unspiritual. It's not being crass and it's not being superficial. It's being smart and putting your effort where it can make the

biggest difference for yourself and others.

The Point of It All: Drumroll, Please

> What man actually needs is not a tensionless state but rather the striving and struggling for a worthwhile goal, a freely chosen task.
>
> —VIKTOR E. FRANKL, Holocaust survivor; author of *Man's Search for Meaning*

I believe that life exists to be enjoyed and that the most important thing is to feel good about yourself.

Each person will have his or her own vehicles for both, and those vehicles will change over time. For some, the answer will be working with orphans, and for others, it will be composing music. I have a personal answer to both—to love, be loved, and never stop learning—but I don't expect that to be universal.

Some criticize a focus on self-love and enjoyment as selfish or hedonistic, but it's neither. Enjoying life and helping others—or feeling good about yourself and increasing the greater good—are no more mutually exclusive than being agnostic and leading a moral life. One does not preclude the other. Let's assume we agree on this. It still leaves the question, "What can I do with my time to enjoy life and feel good about myself?"

I can't offer a single answer that will fit all people, but, based on the dozens of fulfilled **NR** I've interviewed, there are two components that are fundamental: continual learning and service.

Learning Unlimited: Sharpening the Saw

> Americans who travel abroad for the first time are often shocked to discover that, despite all the progress that has been made in the last 30 years, many foreign people still speak in foreign languages.
>
> —DAVE BARRY

To live is to learn. I see no other option. This is why I've felt compelled to quit or be fired from jobs within the first six months or so. The learning curve flattens out and I get bored.

Though you can upgrade your brain domestically, traveling and relocating provides unique conditions that make progress much faster. The different surroundings act as a counterpoint and mirror for your own prejudices, making weaknesses that much easier to fix. I rarely travel somewhere without deciding first how I'll obsess on a specific skill. Here are a few examples:

- **Connemara, Ireland:** Gaelic Irish, Irish flute, and hurling, the fastest field sport in the world (imagine a mix of lacrosse and rugby played with axe handles)

- ► **Rio de Janeiro, Brazil:** Brazilian Portuguese and Brazilian jujitsu

- ► **Berlin, Germany:** German and locking (a form of upright break-dancing)

I tend to focus on language acquisition and one kinesthetic skill, sometimes finding the latter after landing overseas. The most successful serial vagabonds tend to blend the mental and the physical. Notice that I often transport a skill I practice domestically—martial arts—to other countries where they are also practiced. Instant social life and camaraderie. It need not be a competitive sport—it could be hiking, chess, or almost anything that keeps your nose out of a textbook and you out of your apartment. Sports just happen to be excellent for avoiding foreign-language stage fright and developing lasting friendships while still sounding like Tarzan.

Language learning deserves special mention. It is, bar none, the best thing you can do to hone clear thinking.

Quite aside from the fact that it is impossible to understand a culture without understanding its language, acquiring a new language makes you aware of your own language: your own thoughts. The benefits of becoming fluent in a foreign tongue are as underestimated as the difficulty is overestimated. Thousands of theoretical linguists will disagree, but I *know* from research and personal experimentation with more than a dozen languages that (1) adults can learn languages much faster than children[83] when constant 9–5 work is removed and that (2) it is possible to become conversationally fluent in any language in six months or less. At four hours per day, six months can be whittled down to less than three months. It is beyond the scope of this book to explain applied linguistics and the 80/20 of language learning, but resources and complete how-to guides can be found under "language" at www.fourhourblog.com. I learned six languages after failing Spanish in high school, and you can do the same with the right tools.

Gain a language and you gain a second lens through which to question and understand the world. Cursing at people when you go home is fun, too.

Don't miss the chance to double your life experience.

Service for the Right Reasons: To Save the Whales, or Kill Them and Feed the Children?

Morality is simply the attitude we adopt toward people we personally dislike.

—OSCAR WILDE

One would expect me to mention service in this chapter, and here it is. Like all before it, the twist is a bit different. Service to me is simple: doing something that improves life besides your own. This is not the same as philanthropy. Philanthropy is the altruistic concern for the well-being of mankind—human life. Human life has long been focused on the exclusion of the environment and the rest of the food chain, hence our current race to imminent extinction. Serves us right. The world does not exist solely for the betterment and multiplication of mankind.

Before I start chaining myself to trees and saving the dart frogs, though, I should take my own advice: Do not become a cause snob.

How can you help starving children in Africa when there are starving children in Los Angeles? How can you save the whales when homeless people are freezing to death? How does doing volunteer research on coral destruction help those people who need help now?

Children, please. Everything out there needs help, so don't get baited into "my cause can beat up your cause" arguments with no right answer. There are no qualitative or quantitative comparisons that make sense. The truth is this: Those thousands of lives you save could contribute to a famine that kills millions, or that one bush in Bolivia that you protect could hold the cure for cancer. The downstream effects are unknown. Do your best and hope for the best. If you're improving the world—however you define that—consider your job well done.

Service isn't limited to saving lives or the environment either. It can also improve life. If you are a musician and put a smile on the faces of thousands or millions, I view that as service. If you are a mentor and change the life of one child for the better, the world has been improved. Improving the quality of life in the world is in no fashion inferior to adding more lives.

Service is an attitude.

Find the cause or vehicle that interests you most and make no apologies.

► Q&A: QUESTIONS AND ACTIONS

> Adults are always asking kids what they want to be when they grow up because they are looking for ideas.
>
> —PAULA POUNDSTONE

> The miracle is not to walk on water. The miracle is to walk on the green earth, dwelling deeply in the present moment and feeling truly alive.
>
> —THICH NHAT HANH

But I can't just travel, learn languages, or fight for one cause for the rest of my life! Of course you can't. That's not my suggestion at all. These are just good "life hubs"—starting points that lead to opportunities and experiences that otherwise wouldn't be found.

There is no right answer to the question "What should I do with my life?" Forget "should" altogether. The next step—and that's all it is—is pursuing something, it matters little what, that seems fun or rewarding. Don't be in a rush to jump into a full-time long-term commitment. Take time to find something that calls to you, not just the first acceptable form of surrogate work. That calling will, in turn, lead you to something else.

Here is a good sequence for getting started that dozens of **NR** have used with success.

1. **Revisit ground zero: Do nothing**.

Before we can escape the goblins of the mind, we need to face them. Principal among them is speed addiction. It is hard to recalibrate your internal clock without taking a break from constant overstimulation. Travel and the impulse to see a million things can exacerbate this.

Slowing down doesn't mean accomplishing less; it means cutting out counterproductive distractions and the *perception* of being rushed. Consider attending a short silence retreat of 3–7 days during which

all media and speaking is prohibited.

Learn to turn down the static of the mind so you can appreciate more before doing more:

► **The Art of Living Foundation (Course II)—International—(www.artofliving.org)**

► **Spirit Rock Meditation Center in California (http://www.spiritrock.org)**

► **Kripalu Center for Yoga and Health in Massachusetts (http://www.kripalu.org)**

► **Sky Lake Lodge in New York (http://www.sky-lake.org)**

2. **Make an anonymous donation to the service organization of your choice**.
This helps to get the juices flowing and disassociate feeling good about service with getting credit for it. It feels even better when it's pure. Here are some good sites to get started:

►**Charity Navigator (www.charitynavigator.org)**
This independent service ranks more than 5,000 charities using criteria you select. Create a personalized page of favorites and compare them side by side, all free of charge.

►**Firstgiving (www.firstgiving.com)**
Firstgiving.com allows you to create an online fund-raising page. Donations can be made through your personal URL. I have used Firstgiving in coordination with a nonprofit called Room to Read to build schools in both Nepal and Vietnam, with more countries pending: www.firstgiving.com/timferriss and www.firstgiving.com/timferriss2. If you specifically want to help animals, for example, you can click on a related link and access websites for hundreds of different animal charities, and then decide which one you want to donate to. The UK version of the website is http://www.justgiving.com.

►**Network for Good (www.networkforgood.org)**
Visitors to this website will find links to charities in need of donations as well as opportunities to do volunteer work. They can also set up an automated credit card donation online.

3. **Take a learning mini-retirement in combination with local volunteering**.
Take a mini-retirement—six months or more if possible—to focus on learning and serving. The longer duration will permit a language focus, which in turn enables more meaningful interaction and contribution through volunteering.

For the duration of this trip, note self-criticisms and negative self-talk in a journal. Whenever upset or anxious, ask "why" at least three times and put the answers down on paper. Describing these doubts in writing reduces their impact twofold. First, it's often the ambiguous nature of self-doubt that hurts most. Defining and exploring it in writing—just as with forcing colleagues to e-mail—demands clarity of thought, after which most concerns are found to be baseless. Second, recording these concerns seems to somehow remove them from your head.

But where to go and what to do? There is no one right answer to either. Use the following questions and resources to brainstorm:

What makes you most angry about the state of the world?

What are you most afraid of for the next generation, whether you have children or not?

What makes you happiest in your life? How can you help others have the same?

There is no need to limit yourself to one location. Remember Robin, who traveled through South America for a year with her husband and seven-year-old son? The three of them spent one to two months doing volunteer work in each location, including building wheelchairs in Banos, Ecuador, rehabilitating exotic animals in the Bolivian rain forest, and shepherding leather-back sea turtles in Suriname.

How about doing archaeological excavation in Jordan or tsunami relief on the islands of Thailand? These are just two of the dozens of foreign relocation and volunteering case studies in each issue of *Verge Magazine* (www.vergemagazine.com). Reader-tested resources include:

Hands on Disaster Response: www.hodr.org

Project Hope: www.projecthope.org

Relief International: www.ri.org

International Relief Teams: www.irteams.org

Airline Ambassadors International: www.airlineamb.org

Ambassadors for Children:

www.ambassadorsforchildren.org

Relief Riders International:

www.reliefridersinternational.com

Habitat for Humanity Global Village Program:

www.habitat.org

Planeta: Global Listings for Practical Ecotourism:

www.planeta.com

4. **Revisit and reset dreamlines**.
Following the mini-retirement, revisit the dreamlines set in **Definition** and reset them as needed. The following questions will help:

What are you good at?

What could you be the best at?

What makes you happy?

What excites you?

What makes you feel accomplished and good about yourself?

What are you most proud of having accomplished in your life? Can you repeat this or further develop it?

What do you enjoy sharing or experiencing with other people?

5. **Based on the outcomes of steps 1–4, consider testing new part- or full-time vocations**. Full-time work isn't bad if it's what you'd rather be doing. This is where we distinguish "work" from a "vocation."

If you have created a muse or cut your hours down to next to nothing, consider testing a part-time or full-time vocation: a true calling or dream occupation. This is what I did with this book. I can now tell people I'm a writer rather than giving them the two-hour drug dealer explanation. What did you dream of being when you were a kid? Perhaps it's time to sign up for Space Camp or intern as an assistant to a marine biologist.

Recapturing the excitement of childhood isn't impossible. In fact, it's required. There are no more chains—or excuses—to hold you back.

81. Abraham Maslow, the American psychologist famous for proposing "Mas-low's Hierarchy of Needs," would term this goal a "peak experience."

82. There is a place for koans and rhetorical meditative questions, but these tools are optional and outside the scope of this book. Most questions without answers are just poorly worded.

83. Ellen Bialystok and Kenji Hakuta, *In Other Words: The Science and Psychology of Second-Language Acquisition* (Basic Books, 1995).

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The Top 13 New Rich Mistakes

> If you don't make mistakes, you're not working on hard enough problems. And that's a big mistake.
>
> —FRANK WILCZEK, 2004 Nobel Prize winner in physics

> Ho imparato che niente e impossibile, e anche che quasi niente e facile … (I've learned that nothing is impossible, and that almost nothing is easy …)
>
> —ARTICOLO 31 (Italian rap group), "Un Urlo"

Mistake are the name of the game in lifestyle design. It requires fighting impulse after impulse from the old world of retirement-based life deferral. Here are the slipups you will make. Don't get frustrated. It's all part of the process.

1. **Losing sight of dreams and falling into work for work's sake (W4W)** Please reread the introduction and next chapter of this book whenever you feel yourself falling into this trap. Everyone does it, but many get stuck and never get out.

2. **Micromanaging and e-mailing to fill time** Set the responsibilities, problem scenarios and rules, and limits of autonomous decision-making—then stop, for the sanity of everyone involved.

3. **Handling problems your outsourcers or co-workers can handle**

4. **Helping outsourcers or co-workers with the same problem more than once, or with noncrisis problems** Give them if-then rules for solving all but the largest problems. Give them the freedom to act without your input, set the limits in writing, and then emphasize in writing that you will not respond to help with problems that are covered by these rules. In my particular case, all outsourcers have at their discretion the ability to fix any problem that will cost less than $400. At the end of each month or quarter, depending on the outsourcer, I review how their decisions have affected profit and adjust the rules accordingly, often adding new rules based on their good decisions and creative solutions.

5. **Chasing customers, particularly unqualified or international prospects, when you have sufficient cash flow to finance your nonfinancial pursuits**

6. **Answering e-mail that will not result in a sale or that can be answered by a FAQ or auto-responder** For a good example of an auto-responder that directs people to the appropriate information and outsourcers, e-mailinfo@fourhourworkweek.com.

7. **Working where you live, sleep, or should relax** Separate your environments—designate a single space for work and solely work—or you will never be able to escape it.[84]

8. **Not performing a thorough 80/20 analysis every two to four weeks for your business and personal life**

9. **Striving for endless perfection rather than great or simply good enough, whether in your personal or professional life** Recognize that this is often just another W4W excuse. Most endeavors are like learning to speak a foreign language: to be correct 95% of the time requires six months of concentrated effort, whereas to be correct 98% of the time requires 20–30 years. Focus on great for a few things and good enough for the rest. Perfection is a good ideal and direction to have, but recognize it for what it is: an impossible destination.

10. **Blowing minutiae and small problems out of proportion as an excuse to work**

11. **Making non-time-sensitive issues urgent in order to justify work** How many times do I have to say it? Focus on life outside of your bank accounts, as scary as that void can be in the initial stages. If you cannot find meaning in your life, it is your responsibility as a human being to create it, whether that is fulfilling dreams or finding work that gives you purpose and self-worth—ideally a combination of both.

12. **Viewing one product, job, or project as the end-all and be-all of your existence** Life is too short to waste, but it is also too long to be a pessimist or nihilist. Whatever you're doing now is just a stepping-stone to the next project or adventure. Any rut you get into is one you can get yourself out of. Doubts are no more than a signal for action of some type. When in doubt or overwhelmed, take a break and 80/20 both business and personal activities and relationships.

13. **Ignoring the social rewards of life** Surround yourself with smiling, positive people who have absolutely nothing to do with work. Create your muses alone if you must, but do not live your life alone. Happiness shared in the form of friendships and love is happiness multiplied.

84. To avoid the living room and coffee shop as offices, consider using a social "co-working" space on occasion: http://coworking.pbwiki.com.

The Last Chapter

► AN E-MAIL YOU NEED TO READ

There is nothing the busy man is less busied with than living; there is nothing harder to learn.

—SENECA

For the past 33 years, I have looked in the mirror every morning and asked myself: "If today were the last day of my life, would I want to do what I am about to do today?" And whenever the answer has been "No" for too many days in a row, I know I need to change something … almost everything—all external expectations, all pride, all fear of embarrassment or failure—these things just fall away in the face of death, leaving only what is truly important. Remembering that you are going to die is the best way I know to avoid the trap of thinking you have something to lose.

—STEVE JOBS, college dropout and CEO of Apple Computer, Stanford University Commencement, 2005[85]

If you're confused about life, you're not alone. There are almost seven billion of us. This isn't a problem, of course, once you realize that life is neither a problem to be solved nor a game to be won.

If you are too intent on making the pieces of a nonexistent puzzle fit, you miss out on all the real fun. The heaviness of success-chasing can be replaced with a serendipitous lightness when you recognize that the only rules and limits are those we set for ourselves.

So be bold and don't worry about what people think. They don't do it that often anyway.

Two years ago, I was forwarded the following poem—originally written by child psychologist David L. Weatherford—by a close friend. He quit his own deferred-life plan after reading it, and I hope you will do the same. Here it is.

SLOW DANCE

Have you ever watched kids
On a merry-go-round?

Or listened to the rain
Slapping on the ground?

Ever followed a butterfly's erratic flight?
Or gazed at the sun into the fading night?

You better slow down.
Don't dance so fast.

Time is short.
The music won't last.

Do you run through each day
On the fly?

When you ask: How are you?
Do you hear the reply?

When the day is done,
do you lie in your bed

With the next hundred chores
Running through your head?

You'd better slow down.
Don't dance so fast.

Time is short.
The music won't last.

Ever told your child,
We'll do it tomorrow?

And in your haste,
Not see his sorrow?

Ever lost touch,
Let a good friendship die

Cause you never had time
To call and say, "Hi"?

You'd better slow down.
Don't dance so fast.

Time is short.
The music won't last.

When you run so fast to get somewhere
You miss half the fun of getting there.

When you worry and hurry through your day,
It is like an unopened gift thrown away.

Life is not a race.
Do take it slower.

Hear the music
Before the song is over.

85. http://news-service.stanford.edu/news/2005/june15/jobs-061505.html.

Last but Not Least

► THE BEST OF THE BLOG

The Art of Letting Bad Things Happen

[AFTER 3 WEEKS OFF OF THE BLOG]

Long time no see! I just landed back in California from a long overdue mini-retirement through London, Scotland, Sardinia, the Slovak Republic, Austria, Amsterdam, and Japan. Some unpleasant surprises awaited me when I checked in on the evil e-mail inbox. Why? I let them happen.

I always do.

Here are just a few of the goodies that awaited me this time:

- ► One of our fulfillment companies had been shut down due to the CEO's death, causing a 20%+ loss in monthly orders and requiring an emergency shift of all web design and order processing
- ► Missed radio and magazine appearances and upset would-be interviewers
- ► More than a dozen lost joint-venture partnership opportunities

It's not that I go out of my way to irritate people—not at all—but I recognize one critical fact: Oftentimes, in order to do the big things, you have to let the small bad things happen. This is a skill we want to cultivate.

What did I get in exchange for temporarily putting on blinders and taking a few glancing blows?

- ► I followed the Rugby World Cup in Europe and watched the New Zealand All Blacks live, a dream I've had for the last five years.

- ► I shot every gun I've ever dreamed of firing since brainwashing myself with *Commando* . Bless the Slovak Republic and their paramilitaries.

- ► I filmed a television series pilot in Japan, a lifelong dream and the most fun I've had in months, if not years.

- ► I met with my Japanese publisher, Seishisha, and had media interviews in Tokyo, where the 4HWW is now #1 in several of the largest chains.

- ► I took a complete 10-day media fast and felt like I'd had a two-year vacation from computers.

- ► I attended the Tokyo International Film Festival and hung out with one of my heroes, the producer of the *Planet Earth* television series.

Once you realize that you can turn off the noise without the world ending, you're liberated in a way that few people ever know.

Just remember: If you don't have attention, you don't have time. Did I have time to check e-mail and voicemail? Sure. It might take 10 minutes. Did I have the attention to risk fishing for crises in those 10 minutes? Not at all.

As tempting as it is to "just check e-mail for one minute," I didn't do it. I know from experience that any problem found in the inbox will linger in the brain for hours or days after you shut down the computer, rendering "free time" useless with preoccupation. It's the worst of states, where you experience neither relaxation nor productivity. Be focused on work or focused on something else, never in-between.

Time without attention is worthless, so value attention over time.

Here are a few questions that can help you pop on the productivity blinders and put things in perspective. Even when you're not traveling the world, develop the habit of letting small bad things happen. If you don't, you'll never find time for the life-changing big things, whether important tasks or true peak experiences. If you do force the time but puncture it with distractions, you won't have the attention to appreciate it.

- ► What is the one goal, if completed, that could change everything?

- ► What is the most urgent thing right now that you feel you "must"

or "should" do?

- ► Can you let the urgent "fail"—even for a day—to get to the next milestone for your potential life-changing tasks?

- ► What's been on your to-do list the longest? Start it first thing in the morning and don't allow interruptions or lunch until you finish.

Will "bad" things happen? Small problems will crop up, yes. A few people will complain and quickly get over it. BUT, the bigger picture items you complete will let you see these for what they are—minutiae and repairable hiccups.

Make this trade a habit. Let the small bad things happen and make the big good things happen. —
OCTOBER 25, 2007

Things I've Loved and Learned in 2008

2008 was one of the most exciting years of my life. I did more dealmaking and met more people than in the last five years combined. This produced many surprise insights about business and human nature, especially as I uncovered dozens of my own false assumptions.

Here are some of the things I learned and loved in 2008.

Favorite reads of 2008: *Zorba the Greek* and *Seneca: Letters from a Stoic*. These are two of the most readable books of practical philosophies I've ever had the fortune to encounter. If you have to choose one, get *Zorba*, but *Lucius Seneca* will take you further. Both are fast reads of 2–3 evenings.

Don't accept large or costly favors from strangers. This karmic debt will come back to haunt you. If you can't pass it up, immediately return to karmic neutrality with a gift of your choosing. Repay it before they set the terms for you. Exceptions: über-successful mentors who are making introductions and not laboring on your behalf.

You don't have to recoup losses the same way you lose them. I own a home in San Jose but moved almost 12 months ago. It's been empty since, and I'm paying a large mortgage each month. The best part? I don't care. But this wasn't always the case. For many months, I felt demoralized as others pressured me to rent it, emphasizing how I was just flushing money away otherwise. Then I realized: You don't have to make money back the same way you lose it. If you lose $1,000 at the blackjack table, should you try and recoup it there? Of course not. I don't want to deal with renters, even with a property management company. The solution: Leave the house alone, use it on occasion, and just create incoming revenue elsewhere that would cover the cost of the mortgage through consulting, publishing, etc.

One of the most universal causes of self-doubt and depression: trying to impress people you don't like. Stressing to impress is fine, but do it for the right people—those you want to emulate.

Slow meals = life. From Daniel Gilbert of Harvard to Martin Seligman of Princeton, the "happiness" (self-reported well-being) researchers seem to agree on one thing: Mealtime with friends and loved ones is a direct predictor of well-being. Have at least one 2-to-3-hour dinner and/or drinks per week—yes, 2–3 hours—with those who make you smile and feel good. I find the afterglow effect to be greatest and longest with groups of five or more. Two times that are conducive to this: Thursday dinners or after-dinner drinks and Sunday brunches.

Adversity doesn't build character; it reveals it.

Related: Money doesn't change you; it reveals who you are when you no longer have to be nice.

It doesn't matter how many people don't get it. What matters is how many people do. If you have a strong informed opinion, don't keep it to yourself. Try to help people and make the world a better place. If you strive to do anything remotely interesting, just expect a small percentage of the population to always find a way to take it personally. F*ck 'em. There are no statues erected to critics.

Related: **You're never as bad as they say you are**. My agent used to send me every blog or media hit for *The 4-Hour Workweek*. Eight weeks after publication, I asked him to only forward me positive mentions in major media or factual inaccuracies I needed to respond to. An important correlate: You're never as good as they say you are, either. It's not helpful to get a big head or get depressed. The former makes you careless and the latter makes you lethargic. I wanted to have untainted optimism but remain hungry. Speaking of hungry …

Eat a high-protein breakfast within 30 minutes of waking and go for a 10-to-20-minute walk outside afterward, ideally bouncing a handball or tennis ball. This one habit is better than a handful of Prozac in the morning. (Suggested reading: The 3-Minute Slow-Carb Breakfast, How to "Peel" Hardboiled Eggs Without Peeling on www.fourhourblog.com.) **I dislike losing money about 50x more than I like making it**. Why 50X? Logging time as an experiment, I concluded that I often spend at least 50 **x** more time to prevent a hypothetical unit of $100 from being lost vs. earned. The hysterical part is that, even after becoming aware of this bias, it's hard to prevent the latter response. Therefore, I manipulate the environmental causes of poor responses instead of depending on error-prone self-discipline.

I should not invest in public stocks where I cannot influence outcomes. Once realizing that almost no one can predict risk tolerance and response to losses, I moved all of my investments into fixed-income and cashlike instruments in July 2008 for this reason, setting aside 10% of pretax income for angel investments where I can contribute significant UI/design, PR, and corporate partnership help. (Suggested reading: Rethinking Investing—Part 1, Rethinking Investing—Part 2 on www.fourhourblog.com.)

A good question to revisit whenever overwhelmed: Are you having a breakdown or a breakthrough?

Rehearse poverty regularly—restrict even moderate expenses for 1–2 weeks and give away 20%+ of minimally used clothing—so you can think big and take "risks" without fear (Seneca).

A mindset of scarcity (which breeds jealousy and unethical behavior) is due to a disdain for those things easily obtained (Seneca).

A small cup of black Kenyan AA coffee with cinnamon on top, no milk or sweeteners.

It's usually better to keep old resolutions than to make new ones.

To bring in a wonderful 2009, I'd like to quote an e-mail I received from a mentor of more than a decade:

While many are wringing their hands, I recall the 1970s when we were suffering from an oil shock causing long lines at gas stations, rationing, and 55 MPH speed limits on federal highways, a recession, very little venture capital ($50 million per year into VC firms), and what President Jimmy Carter (wearing a sweater while addressing the nation on TV because he had turned down the heat in the White House) called a "malaise." It was during those times that two kids without any real college education, Bill Gates and Steve Jobs, started companies that did pretty well. Opportunities abound in bad times as well as good times. In fact, the opportunities are often greater when the conventional wisdom is that everything is going into the toilet.

Well… we're nearing the end of another great year, and despite what we read about the outlook for 2009, we can look forward to a New Year filled with opportunities as well as stimulating challenges.

Happy New Year, everyone.

How to Travel the World with 10 Pounds or Less

Hauling a five-piece Samsonite set around the planet is hell on earth. I watched a friend do this up and down dozens of subway and hotel staircases in Europe for three weeks, and—while I laughed a lot, especially when he resorted to just dragging or throwing his bags down stairs—I'd like to save you the breakdown. Trip enjoyment is inversely proportionate to the amount of crap (read: distractions) you bring with you.

Practice in 30-plus countries has taught me that minimalist packing can be an art.

I returned from Costa Rica last Wednesday and have since landed in Maui, where I'll stay for one week. **What did I pack and why?** (See the companion video at www.fourhourblog.com.[86])

I practice what I'll label the **BIT method of travel: Buy It There**.

If you pack for every possible contingency—better bring the hiking books in case we go hiking, better bring an umbrella in case it rains, better bring dress shoes and slacks in case we go to a nice restaurant, etc.—carrying a mule-worthy load is inevitable. I've learned to instead allocate $50–200 per trip to a "settling fund," which I use to buy needed items once they're 100% needed. This includes cumbersome and hassle items like umbrellas and bottles of sunscreen that love to explode. Also, never buy if you can borrow. If you're going on a bird-watching trip in Costa Rica, you don't need to bring binoculars—someone else will have them.

Here's the Maui list.

- ► 1 featherweight Marmot Ion jacket (3 oz.!)
- ► 1 breathable Coolibar long-sleeve shirt to prevent sunburn. This saved me in Panama.

- ► 1 pair of polyester pants. Polyester is light, wrinkle-resistant, and dries quickly. Disco dancers and flashpackers dig it.
- ► 1 Kensington laptop lock, also used to secure all bags to stationary objects
- ► 1 single Under Armour sock, used to store sunglasses
- ► 2 nylon tanktops
- ► 1 large MSR quick-dry microfiber towel, absorbs up to seven times its weight in water
- ► 1 Ziploc bag containing toothbrush, travel toothpaste, and disposable razor
- ► 1 Fly Clear biometric travel card (www.flyclear.com), [87] which cuts down my airport wait time about 95%
- ► 2 pairs of ExOfficio lightweight underwear. Their tagline is "17 countries. 6 weeks. And one pair of underwear." I think I'll opt for two, considering they weigh about as much as a handful of Kleenex. One other nice side effect of their weight: They're much more comfortable than normal cotton underwear.
- ► 2 pairs of shorts/swimsuits
- ► 2 books: *Lonely Planet Hawaii* and *The Entrepreneurial Imperative* . (The latter comes highly recommended. Check it out.)
- ► 1 sleeping mask and earplugs

- ► 1 pair of Reef sandals. Best to get a pair with removable straps that go around the heel.

- ► 1 Canon PowerShot SD300 digital camera with extra 2GB SD memory card. God, I love this camera more than words can describe. It is the best designed piece of electronics I have ever owned. I now use it not only for all of my photos and videos, but also as a replacement for my scanner. I'm considering testing the newer and cheaper SD1000.

- ► 1 coffee-harvesting hat to prevent my pale skin from burning off

- ► 1 Kiva keychain expandable duffel bag

- ► 1 Chapstick, 1 Mag-Lite Solitaire flashlight, and 1 roll of athletic tape. The last is a lifesaver. It's as useful as duct tape for repairing objects but gentle enough to use on injuries, which I am fond of inflicting on myself.

- ► 1 Lewis and Clark flex lock (for luggage, lockers, zippers, or whatever I need to lock down/shut together). Standard mini-padlocks are often too cumbersome to thread through holes on lockers, etc.

- ► 1 Radio Shack kitchen timer, which I've been using to wake up for about four years. The problem with using a cell phone alarm to wake up is simple: The phone often needs to be on, and even if you use vibrate, people can call and wake you up before you want to wake up. The second benefit to using a kitchen timer is that you know exactly how much sleep you are—or aren't—getting, and you can experiment with things like caffeine power naps of different durations … but that's another post;)

The Choice-Minimal Lifestyle: 6 Formulas for More Output and Less Overwhelm

I was stressed out… over dog cartoons.

It was 9:47 P.M. at Barnes and Noble on a recent Saturday night, and I had 13 minutes to find a suitable exchange for *The New Yorker Dog Cartoons*, $22 of expensive paper. Bestsellers? Staff recommends? New arrivals or classics? I'd already been there 30 minutes.

Beginning to feel overwhelmed with a ridiculous errand I'd expected to take five minutes, I stumbled across the psychology section. One tome jumped out at me as all too appropriate—*The Paradox of Choice: Why More Is Less*. It wasn't the first time I'd seen or read Barry Schwartz's 2004 classic, but it seemed like a good time to revisit the principles, among them, that:

- ► The more options you consider, the more buyer's regret you'll have.
- ► The more options you encounter, the less fulfilling your ultimate outcome will be.

This raises a difficult question: Is it better to have the best outcome but be less satisfied, or have an acceptable outcome and be satisfied?

For example, would you rather deliberate for months and get the 1 of 20 houses that's the best investment but second-guess yourself until you sell it five years later, or would you rather get a house that is 80% of the investment potential of the former (still to be sold at a profit) but never second-guess it?

Tough call.

Schwartz also recommends making nonreturnable purchases. I decided to keep the stupid pooch cartoons. Why? Because it's not just about being satisfied, it's about being practical.

Income is renewable, but some other resources—like attention—are not. I've talked before about attention as a currency and how it determines the value of time.

For example: Is your weekend really free if you find a crisis in the inbox Saturday morning that you can't address until Monday morning?

Even if the inbox scan lasts 30 seconds, the preoccupation and forward projection for the subsequent 48 hours effectively deletes that experience from your life. You had time but you didn't have attention, so the time had no practical value.

The choice-minimal lifestyle becomes an attractive tool when we consider two truths.

1. **Considering options costs attention that then can't be spent on action or present-state awareness.**

2. **Attention is necessary for not only productivity but appreciation.**

Therefore:

Too many choices = less or no productivity

Too many choices = less or no appreciation

Too many choices = sense of overwhelm

What to do? There are six basic rules or formulas that can be used:

1. Set rules for yourself so you can automate as much decision making as possible [see the rules I use to outsource my e-mail to Canada, included at the end of this section, as an example of this].

2. Don't provoke deliberation before you can take action.

One simple example: Don't scan the inbox on Friday evening or over the weekend if you might encounter work problems that can't be addressed until Monday.

3. Don't postpone decisions just to avoid uncomfortable conversations.

If an acquaintance asks you if you want to come to their house for dinner next week, and you know you won't, don't say, "I'm not sure. I'll let you know next week." Instead, use something soft but conclusive like, "Next week? I'm pretty sure I have another commitment on Thursday, but thank you for the invite. Just so I don't leave you hanging, let's assume I can't make it, but can I let you know if that changes?" Decision made. Move on.

4. Learn to make nonfatal or reversible decisions as quickly as possible.

Set time limits (I won't consider options for more than 20 minutes), option limits (I'll consider no more than three options), or finance thresholds (Example: If it costs less than $100 [or the potential damage is less than $100], I'll let a virtual assistant make the judgment call).

I wrote most of this post after landing at the monster that is ATL airport in Atlanta. I could have considered half a dozen types of ground transportation in 15 minutes and saved 30–40%, but I grabbed a taxi instead. To use illustrative numbers: I didn't want to sacrifice 10 attention units of my remaining 50 of 100 total potential units, since those 10 units couldn't then be spent on this article. I had about eight hours before bedtime due to time zone differences—plenty of time—but scarce usable attention after an all-nighter of fun and the cross-country flight. **Fast decisions preserve usable attention for what matters.**

5. Don't strive for variation—and thus increase option consideration—when it's not needed. Routine enables innovation where it's most valuable.

In working with athletes, for example, it's clear that those who maintain the lowest bodyfat percentage eat the same foods over and over with little variation. I've eaten the same "slow-carb" breakfast and lunch for nearly two years,[88] putting variation only into meals that I focus on for enjoyment: dinner and all meals on Saturdays. This same routine-variation distinction can be found in exercise vs. recreation. For fat loss and muscle gain (even as much as 34 pounds in four weeks), I've followed the same time—minimal exercise protocol with occasional experiments since 1996. For recreation, however, where the focus is enjoyment and not efficacy, I tend to try something new each weekend, whether climbing at Mission Cliffs in San Francisco or mountain biking from tasting to tasting in Napa.

Don't confuse what should be results-driven with routine (e.g., exercise) with something enjoyment-driven that benefits from variation (e.g., recreation).

6. Regret is past-tense decision making. Eliminate complaining to minimize regret.

Condition yourself to notice complaints and stop making them with a simple program like the "21-day no-complaint experiment" made famous by Will Bowen, where you wear a single bracelet and move it from one wrist to the other each time you complain. The goal is 21 days without complaining and you reset to 0 each time you slip up. This increased awareness helps prevent useless past-tense deliberation and negative emotions that improve nothing but deplete your attention.

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DECISION-MAKING ISN'T to be avoided—that's not the problem. Look at a good CEO or top corporate performer and you'll see a high volume of decisions.

It's deliberation—the time we vacillate over and consider each decision—that's the attention consumer. Total deliberation time, not the number of decisions, determines your attention bank account balance (or debt).

Let's assume you pay 10% over time by following the above rules but cut your average "decision cycle" time by an average of 40% (10 minutes reduced to 6 minutes, for example). Not only will you have much more time and attention to spend on revenue-generating activities, but you'll get greater enjoyment from what you have and experience. Consider that 10% additional cost as an investment and part of your "ideal lifestyle tax," but not as a loss.

Embrace the choice-minimal lifestyle. It's a subtle and under-exploited philosophical tool that produces dramatic increases in both output and satisfaction, all with less overwhelm.

Make testing a few of the principles the first of many fast and reversible decisions. ***—FEBRUARY 6, 2008***

The Not-to-Do List: 9 Habits to Stop Now

"Not-to-do" lists are often more effective than to-do lists for upgrading performance.

The reason is simple: What you don't do determines what you can do.

Here are nine stressful and common habits that entrepreneurs and office workers should strive to eliminate. The bullets are followed by more detailed descriptions. Focus on one or two at a time, just as you would with high-priority to-do items.

1. Do not answer calls from unrecognized phone numbers.

Feel free to surprise others, but don't be surprised. It just results in unwanted interruption or poor negotiating positions. Let it go to voicemail, and consider using a service like GrandCentral (you can listen to people leaving voicemail or receive them as text messages) or Phonetag.com (receive voicemails as e-mail).

2. Do not e-mail first thing in the morning or last thing at night.

The former scrambles your priorities and plans for the day, and the latter just gives you insomnia. E-mail can wait until 10 A.M., after you've completed at least one of your critical to-do items.

3. Do not agree to meetings or calls with no clear agenda or end time.

If the desired outcome is defined clearly with a stated objective and agenda listing topics/questions to cover, no meeting or call should last more than 30 minutes. Request them in advance so you "can best prepare and make good use of the time together."

4. Do not let people ramble.

Forget "How's it going?" when someone calls you. Stick with "What's up?" or "I'm in the middle of getting something out, but what's going on?" A big part of GTD (Getting Things Done) is GTP—Getting To the Point.

5. Do not check e-mail constantly—"batch" and check at set times only.

I belabor this point enough. Get off the cocaine pellet dispenser and focus on execution of your top to-do's instead of responding to manufactured emergencies. Set up a strategic autoresponder and check twice or thrice daily.

6. Do not over-communicate with low-profit, high-maintenance customers.

There is no sure path to success, but the surest path to failure is trying to please everyone. Do an 80/20 analysis of your customer base in two ways—which 20% are producing 80%+ of my profit, and which 20% are consuming 80%+ of my time? Then put the loudest and least productive on autopilot by citing a change in company policies. Send them an e-mail with new rules as bullet points: number of permissible phone calls, e-mail response time, minimum orders, etc. Offer to point them to another provider if they aren't able to adopt the new policies.

7. Do not work more to fix overwhelmingness—prioritize.

If you don't prioritize, everything seems urgent and important. If you define the single most important task for each day, almost nothing seems urgent or important. Oftentimes, it's just a matter of letting little bad things happen (return a phone call late and apologize, pay a small late fee, lose an unreasonable customer, etc.) to get the big important things done. The answer to overwhelmingness is not spinning more plates—or doing more—it's defining the few things that can really fundamentally change your business and life.

8. Do not carry a cell phone or Crackberry 24/7.

Take at least one day off of digital leashes per week. Turn them off or, better still, leave them in the garage or in the car. I do this on at least Saturday, and I recommend you leave the phone at home if you go out for dinner. So what if you return a phone call an hour later or the next morning? As one reader put it to a miffed co-worker who worked 24/7 and expected the same: *"I'm not the president of the U.S. No one should need me at 8 P.M. at night. OK, you didn't get a hold of me. But what bad happened?"* The answer? Nothing.

9. Do not expect work to fill a void that non-work relationships and activities should.

Work is not all of life. Your co-workers shouldn't be your only friends. Schedule life and defend it just as you would an important business meeting. Never tell yourself "I'll just get it done this weekend." Review Parkinson's Law and force yourself to cram within tight hours so your per-hour productivity doesn't fall through the floor. Focus, get the critical few done, and get out. E-mailing all weekend is no way to spend the little time you have on this planet.

It's hip to focus on getting things done, but it's only possible once we remove the constant static and distraction. If you have trouble deciding what to do, just focus on not doing. Different means, same end. *—AUGUST 16, 2007*

The Margin Manifesto: 11 Tenets for Reaching (or Doubling) Profitability in 3 Months

Profitability often requires better rules and speed, not more time. The financial goal of a start-up should be simple: profit in the least time with the least effort. Not more customers, not more revenue, not more offices or more employees. More profit.

Based on my interviews with high-performing (using profit-per-employee metrics) CEOs in more than a dozen countries, here are the 11 basic tenets of the "Margin Manifesto" … a return-to-basics call that gives permission to do the uncommon to achieve the uncommon: consistent profitability, or doubling of it, in three months or less.

I review the following principles whenever facing operational overwhelmingness or declining/stagnating profits. Hope you find them useful.

1. Niche Is the New Big—The Lavish Dwarf Entertainment Rule

Several years ago, an investment banker was jailed for trade violations. He was caught partly due to his lavish parties on yachts, often featuring hired dwarves. The owner of the dwarf rental company, Danny Black, was quoted in the *Wall Street Journal* as saying "Some people are just into lavish dwarf entertainment." Niche is the new big. But here's the secret: It's possible to niche market and mass sell. iPod commercials don't feature dancing 50-year-olds, they feature hip and fit 20- and 30-somethings, but everyone and his grandmother wants to feel youthful and hip, so they strap on Nanos and call themselves Apple converts. Who you portray in your marketing isn't necessarily the only demographic who buys your product—it's often the demographic that most people want to identify with or belong to. The target isn't the market. No one aspires to be the bland average, so don't water down messaging to appeal to everyone—it will end up appealing to no one.

2. Revisit Drucker—What Gets Measured Gets Managed

Measure compulsively, for as Peter Drucker stated, What gets measured gets managed. Useful metrics to track, besides the usual operational stats, include CPO ("Cost-Per-Order," which includes advertising, fulfillment and expected returns, charge-backs, and bad debt), ad allowable (the maximum you can spend on an advertisement and expect to break even), MER (media efficiency ratio), and projected lifetime value (LV) given return rates and reorder percent. Consider applying direct response advertising metrics to your business.

3. Pricing Before Product—Plan Distribution First

Is your pricing scalable? Many companies will sell direct-to-consumer by necessity in early stages, only to realize that their margins can't accommodate resellers and distributors when they come knocking. If you have a 40% profit margin and a distributor needs a 70% discount to sell into wholesale accounts, you're forever limited to direct-to-consumer … unless you increase your pricing and margins. It's best to do this beforehand if possible—otherwise, you'll need to launch new or "premium" products—so plan distribution before setting pricing. Test assumptions and find hidden costs by interviewing those who have done it: Will you need to pay for co-op advertising, offer rebates for bulk purchases, or pay for shelf space or featured placement? I know one former CEO of a national brand who had to sell his company to one of the world's largest soft drink manufacturers before he could access front-of-store shelving in top retailers. Test your assumptions and do your homework before setting pricing.

4. Less Is More—Limiting Distribution to Increase Profit

Is more distribution automatically better? No. Uncontrolled distribution leads to all manner of headache and profit-bleeding, most often related to rogue discounters. Reseller A lowers pricing to compete with online discounter B, and the price cutting continues until neither is making sufficient profit on the product and both stop reordering. This requires you to launch a new product, as price erosion is almost always irreversible. Avoid this scenario and consider partnering with one or two key distributors instead, using that exclusivity to negotiate better terms: less discounting, prepayment, preferred placement and marketing support, etc. From iPods to Rolex and Estée Lauder, sustainable high-profit brands usually begin with controlled distribution. Remember, more customers isn't the goal; more profit is.

5. Net-Zero—Create Demand vs. Offering Terms

Focus on creating end-user demand so you can dictate terms. Often one trade publication advertisment, bought at discount remnant rates, will be enough to provide this leverage. Outside of science and law, most "rules" are just common practice. Just because everyone in your industry offers terms doesn't mean you have to, and offering terms is the most consistent ingredient in start-up failure. Cite start-up economics and the ever-so-useful "company policy" as reasons for prepayment and apologize, but don't make exceptions. Net-30 becomes net-60, which becomes net-120. Time is the most expensive asset a start-up has, and chasing delinquent accounts will prevent you from generating more sales. If customers are asking for your product, resellers and distributors will need to buy it. It's that simple. Put funds and time into strategic marketing and PR to tip the scales in your favor.

6. Repetition Is Usually Redundant—Good Advertising Works the First Time

Use direct response advertising (call-to-action to a phone number or website) that is uniquely trackable —fully accountable advertising—instead of image advertising, unless others are pre-purchasing to offset the cost (e.g., "If you prepurchase 288 units, we'll feature your store/URL/phone exclusively in a full-page ad in…"). Don't listen to advertising salespeople who tell you that 3, 7, or 27 exposures are needed before someone will act on an advertisement. Well-designed and well-targeted advertising works the first time. If something works partially well (e.g., high response with low percentage conversion to sales, low response with high conversion, etc.), indicating that a strong ROI might be possible with small changes, tweak one controlled variable and microtest once more. Cancel anything that cannot be justified with a trackable ROI.

7. Limit Downside to Ensure Upside—Sacrifice Margin for Safety

Don't manufacture product in large quantities to increase margin unless your product and marketing are tested and ready for rollout without changes. If a limited number of prototypes cost $10 per piece to manufacture and sell for $11 each, that's fine for the initial testing period, and essential for limiting downside. Sacrifice margin temporarily for the testing phase, if need be, and avoid potentially fatal upfront overcommitments.

8. Negotiate Late—Make Others Negotiate Against Themselves

Never make a first offer when purchasing. Flinch after the first offer ("$3,000!" followed by pure silence, which uncomfortable salespeople fill by dropping the price once), let people negotiate against themselves ("Is that really the best you can offer?" elicits at least one additional drop in price), then "bracket." If they end up at $2,000 and you want to pay $1,500, offer $1,250. They'll counter with approximately $1,750, to which you respond: "I'll tell you what—let's just split the difference. I'll overnight FedEx you a check, and we can call it a day." The end result? Exactly what you wanted: $1,500.

9. Hyperactivity vs. Productivity—80/20 and Pareto's Law

Being busy is not the same as being productive. Forget about the start-up overwork ethic that people wear as a badge of honor—get analytical. The 80/20 principle, also known as Pareto's Law, dictates that 80% of your desired outcomes are the result of 20% of your activities or inputs. Once per week, stop putting out fires for an afternoon and run the numbers to ensure you're placing effort in high-yield areas: What 20% of customers/products/ regions are producing 80% of the profit? What are the factors that could account for this? Invest in duplicating your few strong areas instead of fixing all of your weaknesses.

10. The Customer Is Not Always Right—"Fire" High-Maintenance Customers

Not all customers are created equal. Apply the 80/20 principle to time consumption: What 20% of people are consuming 80% of your time? Put high-maintenance, low-profit customers on autopilot—process orders but don't pursue them or check up on them—and "fire" high-maintenance, high-profit customers by sending a memo detailing how a change in business model requires a few new policies: how often and how to communicate, standardized pricing and order process, etc. Indicate that, for those clients whose needs are incompatible with these new policies, you are happy to introduce other providers. "But what if my largest customer consumes all of my time?" Recognize that (1) without time, you cannot scale your company (and, oftentimes, life) beyond that customer, and (2) people, even good people, will unknowingly abuse your time to the extent that you let them. Set good rules for all involved to minimize back-and-forth and meaningless communication.

11. Deadlines Over Details—Test Reliability Before Capability

Skills are overrated. Perfect products delivered past deadline kill companies faster than decent products delivered on time. Test someone's ability to deliver on a specific and tight deadline before hiring them based on a dazzling portfolio. Products can be fixed as long as you have cash flow, and bugs are forgiven, but missing deadlines is often fatal. Calvin Coolidge once said that nothing is more common than unsuccessful men with talent; I would add that the second most common is smart people who think their IQ or resume justifies delivering late. ***—JUNE 24, 2008***

The Holy Grail: How to Outsource the Inbox and Never Check E-

mail Again

What if you never had to check e-mail again? If you could hire someone else to spend countless hours in your inbox instead of you?

This isn't pure fantasy. For the last 12 months, I've experimented with removing myself from the inbox entirely by training other people to behave like me. Not to imitate me, but to think like me.

Here's the upshot: I get more than 1,000 e-mails a day from various accounts.[89] Rather than spending 6–8 hours per day checking e-mail, which I used to do, I can skip reading e-mail altogether for days or even weeks at a time … all within 4–10 minutes a night.

Let me explain the basics, followed by tips and exact templates for outsourcing your own inbox.

1. I have multiple e-mail addresses for specific types of e-mail (blog readers vs. media vs. friends/family, etc.). tim@ … is the default I give to new acquaintances, which goes to my assistant.

2. 99% of e-mail falls into predetermined categories of inquiries with set questions or responses (my "rules" document is at the bottom of this post—feel free to steal, adapt, and use). My assistant(s) checks and clears the inbox at 11 A.M. and 3 P.M. pst.

3. For the 1% of e-mail that might require my input for next actions, I have a once-daily phone call of 4–10 minutes at 4 P.M. pst with my assistant.

4. If I'm busy or traveling abroad, my assistant leaves the action items in numerical order on my voicemail, which I can respond to in a bullet-point e-mail. These days, I actually prefer the voice-mail option and find that it forces my assistant to be more prepared and more concise.

Each night (or early the next morning), I'll listen to my assistant's voicemail via Skype and simultaneously write out the next actions (1. Bob: Tell him that … 2. Jose in Peru: Ask him for … 3. Speaking in NC: Confirm …, etc.) in a Skype chat or quick e-mail. How long does the new system take? 4–10 minutes instead of 6–8 hours of filtering and repetitive responses.

If you only have one e-mail account, I recommend using a desktop program like Outlook or Mail instead of a web-based program like Gmail for a simple reason: If you see new items in your inbox, you'll check them. Like they say in AA: If you don't want to slip, don't go where it's slippery. This is why I have a private personal account that I use for sending e-mail to my assistant and communicating with friends. It's almost always empty.

E-mail is the last thing people let go of. Fortune 500 CEOs, best-selling authors, celebrities—I know dozens of top performers who delegate everything but e-mail, which they latch onto as something only they can do. "No one can check my e-mail for me" is the unquestioned assumption, or "I answer every e-mail I receive" is the unquestioned bragging right that keeps them in front of a computer for 8–12 hours at a stretch. It's not fun, and it keeps them from higher-impact or more rewarding activities.

Get over yourself. I had to. Checking e-mail isn't some amazing skill that you alone possess.

In fact, checking e-mail is like everything else: a process.

How you evaluate and handle (delete vs. archive vs. forward vs. respond) e-mail is just a series of questions you ask yourself, whether consciously or subconsciously. I have a document called "Tim Ferriss Processing Rules," to which my assistants add rules when I send them a note via e-mail with "ADD TO RULES" in the subject. Over the course of a week or two with a virtual assistant (VA), you will end up with an externalized set of rules that reflect how your brain processes e-mail. It often shows you how haphazard your processing is. I've included my "rules" here to save you some time. A few tips:

1. Setting appointments and meetings takes a lot of time. Have your assistant set things up for you in Google Calendar. I input my own items via my Palm Z22 or iCal, then use Spanning Sync and Missing Sync for Palm OS to sync everything. On my überlight Sony VAIO, which I still use for travel, I use CompanionLink for Google Calendar. I suggest batching meetings or calls in one or two set days, with 15 minutes between appointments. Scattering them throughout the week at odd times just interrupts everything else. (Update 2009: The Palm Z22 has been discarded, and I now use a 13-inch MacBook and BusySync to synchronize iCal with Google Calendar.)

2. If you jump in your assistant's inbox and answer anything, BCC them so they are aware that you handled it.

3. Expect small problems. Life is full of compromises, and it's necessary to let small bad things happen if you want to get huge good things done. There is no escape. Prevent all problems and get nothing done, or accept an allowable level of small problems and focus on the big things.

Ready to jump in and test the holy grail? Here are the steps.

1. Determine exactly which accounts you will use and how you want them to respond to (or just categorize or purge) e-mail for you.

2. Find a virtual assistant.

3. Test for reliability before skill set. Have the top three candidates do something on tight deadline (24 hours) before hiring them and letting them in your inbox.

4. Use a probationary period of 2–4 weeks to test the waters and work out the problems. Again: There will be problems. It will take a good 3–8 weeks to get to real smooth sailing.

5. Design your ideal lifestyle and find something to do other than let your brain fester in the inbox. Fill the void.

• • •

Tim Ferriss Processing Rules[90]

[Note the Q&A format—some of the questions are my standard points for VAs, some have been added by my assistant, who put together this document.]

Passwords

Calendar http://calendar.google.com Login: XXXX PW: XXXX	**www.SpamArrest.com** Username: XXXX Password: XXXX
Google G-mail Account http://mail.google.com Username: XXXX PW: XXXX	**www.Amazon.com** Username: XXXX Password: XXXX
www.NoCostConference.com Username: XXXX Password: XXXX	**www.PayPal.com** Username: XXXX Password: XXXX

Reader-Only Resources
http://fourhourworkweek.com/wms/members/members.php >>
PASSWORD FOR READERS ONLY IS: XXXX

Team Requirements

[I often have exec-level assistants manage 4–5 other "sub VAs" who handle certain repetitive tasks, often at half the exec VA's hourly rate. The exec VA takes on an office manager or, in some cases, COO-level function.]

- ► Download: www.alexa.com —Toolbar
- ► Learn Statistics, Rank for Business Prospect and Joint-Venture Opportunities
- ► Deadlines are extremely important. Be Aware of them, and Be Punctual!
- ► If Tim says "Call me back," CALL HIM BACK, do not send an e-mail. This is an important point, as Tim does not always have e-mail access because he is traveling a lot.
- ► Even if it is late in the evening, he is up late, if he does not want to answer his phone, he will not. But PLEASE call him back when he asks you to. He much prefers a phone call to an e-mail.

- ► Purchase and read *The Elements of Style* regarding proper grammar and punctuation. We are dealing with high-profile clients on Tim's behalf and the proper writing techniques and message says a lot about his team.

- ► Become as familiar as you can with his book and his website as to answer questions accordingly.

Contact Information

Tim Ferriss
[mailing address]

Tim Cell (your use only): [private cell]
Number to give others: [GrandCentral number]
Skype: XXXXX
Billing Address (Private):
[billing address]

Purchases

ASK [head VA], for his AMEX NUMBER. SHE WILL ADVISE WHETHER PURCHASES CAN BE APPROVED.

Question and Answer (Preferences)

1. How do you feel about joint ventures?

   I'm open to them, but my brand and respectability is #1. I will not do anything with anyone who comes off as deceptive or amateur. "Make millions while you sleep in our super-insane foreclosure program!" on the website disqualifies someone. I cannot be associated with anyone who might be seen as a liar or snake-oil salesman. Just ask yourself: If the CEO of a well-known company saw this, would he lose interest in speaking with me? If so, it won't work.

   For those who pass that criteria, what have they done already? I'm not looking for first-timers, generally, unless they have an excellent track record and reputation elsewhere.

2. Do you focus solely on profit-generating tasks?

   No. I also look for prestige (Harvard, government, etc.), wide exposure, as well as building networks with people who have world-class skills in some area.

3. How do you handle spam?

   SpamArrest and Gmail. I have no problem with spam at this point.

4. What is your optimal response rate (i.e., respond to all e-mails no later than 48–72 hours after received)?

   Same day. I'm bringing you on to respond quickly.

5. Do you respond to any e-mails?

   Yes, but I'll want you to filter them first, respond to all you can, then mark the ones I should look

at with the label "TIM" in Gmail. [Note earlier in this article how I am now asking VAs to leave to-do's via voicemail.]

6. Do you put in any events in your calendar?

   Yes, but I expect I will move more and more to having you do it.

7. Do we "manage" your items, or do you delegate? We are cool with both, but prefer to manage.:-)

   I'll try to give the list to you to take care of. I NEED confirmations that you received the task ("on it—will be done at X P.M." is enough) and like status updates on larger projects with milestones.

8. Who is on your team?

   Me, the publishing team, and some PR folk at this point. I might have you get involved with my other businesses later, but that's it for now.

9. Who do we have to collaborate with on a regular basis?

   See above. 90% me, then possibly my publicist(s), tech support and web staff, and my book agent. More will come, I'm sure, but that's it for now.

10. Who calls the shots for you?

    You can decide anything under $100. Use your judgment and report the decisions.

11. Do you have "days" off (as in no business appts.)?

    Let's shoot for no appointments on Fridays, but let's play it by ear. [Update: I now only have appointments on Mondays and Fridays.]

12. Who has been handling your appts. up until now?

    Me. I haven't had any in-person meetings for close to four years. Things have changed with the book:)

13. Explain to us your "optimal" work week (i.e., how long between phone calls, how many meetings per week, travel preferences, etc.)?

    - ► I go to bed late, so try and avoid calls before 10 A.M. pst when possible.

    - ► Try and "cluster" phone calls and meetings so that I can bang them out at the same time, as opposed to having one at 10 A.M. , another at 1 P.M ., and another at 4 P.M . Have them all in a row with 15–20 minutes in between whenever possible. I'd like to do phone calls before 1 P.M . pst when possible (so 10 A.M.-1 P.M .). Calls should be kept to 15–30 minutes, always with a defined end time. If someone asks to "jump on the phone" with me, send them something like: "To make the best use of everyone's time, Tim likes to have a well-defined agenda with objectives for a call before jumping on the phone. Can you please send over some bullet points with what you'd like

to cover and decide on the call?" Something like that.

14. Do you like us to schedule personal items in with your business calendar (i.e., order your mother flowers for Mother's Day, etc.)? Absolutely.
15. What are "all" the e-mail addresses we respond to for you? See earlier text.
16. Do you like us to respond as "you" or something like "client support for Timothy Ferriss."

    The latter, probably something like "Executive Assistant to Tim Ferriss" below your name—I'm open to suggestions.
17. How many times a day do you want e-mail checked?

    Twice should be fine to start. Let's aim for a minimum of at 11 A.M. and 3 P.M. in your time zone.
18. What are your working hours?

    10 A.M.-6 P.M. pst, then often 11 p.m.-2 A.M. pst. [Before you cry, "What happened to the four-hour workweek?!" realize that "work hours" here could be replaced with "active and available-by-phone hours." I have lots of projects and do not preach idleness. I am VERY active. See the sixth comment on this post on www.fourhourblog.com for more elaboration or reread the "Filling the Void" chapter in this book.]
19. Do you like using IM?Not really, unless it's a scheduled discussion. Just leave yourself logged in, and I'll log in if I need something. [I tend to use Skype chat these days, as it's encrypted and I can avoid a separate IM program.]
20. Do you prefer a phone call or an e-mail to answer a quick question?

    PHONE CALL, absolutely. DO NOT e-mail me for anything urgent. I really follow my own advice and don't check e-mail that often.
21. What is your favorite color?

    Green like cedar leaves in July.
22. Call at the end of every day (if) there is something that Tim needs to respond to in his e-mail.
23. E-books: Tell them they can download the e-bookfromwww.powells.com.
24. Label all e-mails from "Expert Click" for Tim. No need to respond or forward.
25. All Linked-In e-mails can be archived or deleted as Tim receives notification of invites as soon as he logs into his Linked-In account.
26. For start-up inquiries in the health and wellness industry (or BrainQUICKEN start-up inquiries) please see the templates in

    Gmail titled: Congratulations and General Business Questions—BrainQUICKEN Templates.
27. For language inquiries, please see the templates in Gmail titled: Reader Question on Language Resources—Language Templates.
28. When Tim types "dictate" in the e-mail response, this means that we can say to the recipient: As Tim is traveling at the moment and not able to personally respond to your e-mail, I mentioned your message while on the phone to him, and he asked me to dictate. This makes the process easier as we do not have to change the context of the person responding.

    [This is to avoid having an assistant convert my first-person "Please tell him that I …" to third-person "Tim says that he …"—providing shorthand for "cut and paste" saves hours of assistant time.]
29. If someone e-mail blasts a bunch of people and I am one of them, usually safe to ignore or delete. Read them carefully, of course, but if it says for example "a few influential people I know" or something like that then if someone can't take the time to personalize for me, forget them. If Tim is

copied, of course, that's a different story.

30. Tim's address is XXXX. THIS E-MAIL IS NOT TO BE DISTRIBUTED OR GIVEN TO ANYONE. If you want to copy Tim on an e-mail, please use the BCC field, so that it remains private.
31. Mark anyone from Princeton for me to look at (TIM label). [Note: I've since had to modify this due to volume.]
32. If I decline someone and they persist, give them one more reply—"Tim appreciates the persistence, but he really can't..." etc.—and then archive future requests. Use your judgment, of course, but that's the general rule. Some people don't know when persistent turns into plain irritating.
33. Please also create a rule to respond with "scheduled" for all items I send to be put in the calendar (when they're put in the calendar). Missing calendar items can cause big problems, so this is a check and balance to confirm.
34. No need to follow up with someone after a call has taken place unless Tim instructs otherwise, or they request something from us.
35. Send all speaking requests to XXXX and ensure that he confirms receipt. (However, also see items 38 and 39).
36. Foreign language requests (i.e., purchasing rights, if the book is available in a particular language, etc.) send to [the appropriate person at my publisher].
37. XXXX's replacement at Random House is XXXX.
38. Inquire with Tim first before booking any speaking gigs on a specific date, as he may be traveling.
39. When booking appointments in the calendar, be sure to also ask which topics they would like to discuss, and put them in the calendar description for Tim so he can prepare. Also be sure to ask for a backup phone number in case they are not able to reach Tim. [I almost always have people call me unless I am abroad, as this is another safeguard against missing appointments.]
40. Put initials in the subject line of calendar events so we know who (which virtual assistant) put the item in the calendar.
41. Prepare inquiries for Tim before sending to him for his review, i.e., get their Alexa ranking, possible dates of the event, a link to past events they have held, their budget, other confirmed speakers, etc. Then send this info to Tim for his review.
42. Respond to PX Method inquiries with the following response:

    Hi [name],

    Thanks for your inquiry about the PX Method, however the PX Method page is designed as just a template others can look at as a reference for testing their own product ideas.

    We are not sure if or when Tim will offer the PX Method for sale, but there are no plans at this time. We appreciate your inquiry nonetheless. Thanks!

    [I get quite a few e-mails from readers who do not see the disclaimer on the PX Method mock-up page and thus attempt to order a product that isn't ready to ship.]
43. Download eFAX viewer to view Tim's faxes. His fax number is: XXXX.
44. Event or speaking inquiries can be responded to as such:

    Thanks for your e-mail and for your invitation to Tim. In looking at the event online, I see that the event is April X and X, 20XX in Portland, Oregon [for example]. Before I present this to Tim, could you answer a few questions for me, so we can make a more informed decision?

- Would you like Tim to be at the entire event?

- ► How long would the keynote presentation be? Or would it be a Q&A panel?
- ► Do you cover travel and accommodation along with a speaker's fee?
- ► What is your budget for keynote presentations?
- ► Have any other speakers confirmed to present?

As soon as I hear back, I can speak with Tim about the possibilities of making this happen. Thanks again!

Warmly,

[Name]

this e-mail is: [] blogable [x] ask first [] private

[name]

Executive Assistant to Timothy Ferriss

Author: *The 4-Hour Workweek*

(http://www.fourhourworkweek.com)

(Random House/Crown Publishing)

Bio and Fun: http://www.fourhourworkweek.com/blog

—JANUARY 21, 2008

Proposal to Work Remotely on a Contract Basis

This is the actual remote-work proposal reader Autumn Brookmire used successfully to move to Argentina while retaining her job and cutting back to 5–10 hours per week of work.

AUTUMN BROOKMIRE July 2008

Background

After working for the [company name] for more than two years, I have a great loyalty to the people and mission of this organization. I believe I have added a great deal of value to the organization in my position as marketing coordinator. With my creative problem solving and my cost effective solutions I have changed the way we produce and distribute our holiday cards and I've developed a contest to bring in more usable photos for our marketing and publications. I would like to propose continuing to perform the following tasks for [company name], but on a contract basis, remotely. I plan to live in Argentina for 6–12 months starting in September of 2008. My goals are to develop my fluency in the Spanish language and immerse myself in another culture and completely foreign environment so that I develop my skills in adaptation to new ways of thinking.

I am more than happy to discuss different ways to make this possible and I have some suggestions if [company name] would be willing to consider them. We can test this arrangement for a few months to see if it works for both of us, since that would make the most sense.

Role #1: Graphic Design and Print Advertising Coordinator

Responsibility:

Create timelines for print materials and coordinate with respective program teams.

Expectations:

- Print materials will be completed on time.

Responsibility:

Coordinate design projects with program directors and outside graphic artists/designers.

Expectations:

- Print materials designs are suitable for the audience, accurate, and appealing.
- Print materials are professional quality and produced within set timelines.

Responsibility:

Maintain relationships with print vendors to minimize cost relative to time and quality in producing program print materials.

Expectations:

- Print materials are printed within the established budget, unless budget overages are specifically approved by the Director of Marketing.

Contract Solution:

By using e-mail and web-based programs such as

*ConceptShare, I can continue to coordinate these design projects from a distance. I currently maintain relationships with print vendors and designers at a distance so physical presence is not necessary for this to continue. For meetings with program directors and the marketing team, I would use a free video and phone conferencing service called *Skype. We usually meet once or twice to discuss changes to their marketing materials and the rest of the process is continued through e-mail and ConceptShare.

Role #2: Special Marketing Project Manager

Responsibility:

Maintain a collection of updated, appropriate marketing images.

Expectations:

- Images needed for marketing materials and websites are anticipated and acquired.

Contract Solution:

I am still able to complete this task remotely by doing images searches on web databases such as *iStockphoto.com. If the experiment with the *Seminar Photo Contest fares well, I could also manage

that process via the web using Aptify, e-mail, and Skype.

Responsibility:

Identify and implement new opportunities to leverage marketing materials.

Expectations:

- Ideas are researched for feasibility and effectiveness.
- Chosen projects are designed and sent out within the budget and timeline.

Contract Solution:

I would utilize e-mail and Skype to communicate any new ideas and opportunities to leverage marketing materials. I have recently proposed creating a one-page calendar of our program deadlines to distribute to our recent seminar alumni in a fall mailing. This way students will have an easy way to remember all of our deadlines for our programs and may potentially boost our number of applicants.

Role #3: Web-based Marketing Coordinator

Responsibility:

Contribute to online advertising efforts and track results.

Expectations:

- Online efforts are increasingly cost effective.
- Marketing Director is informed of web-based marketing results as requested.

Contract Solution:

I am familiar with our online advertising efforts and can continue to help with this process from a distance. I will be able to access Facebook Ads, Google Ads, Blog Ads and aid Keri in gathering and entering data. I have experience working with our Facebook and Google Ads and have created images for Blog Ads in the past. Launching new Ads will be easily managed abroad.

Responsibility:

Compile collection of updated, appropriate web photos.

Expectations:

- Attractive, updated photos will be available for program and marketing uses.

Contract Solution:

As stated above with the stock photo inventory, I am still able to complete this task remotely by conducting image searches on web databases such as iStockphoto.com. The Seminar Photo Contest will also be used as a tool to aid in this compilation of images while I am abroad.

In order to more effectively track the cost of production of our print materials, I think [company name] would find value in transitioning to a contract basis for this position. I have really enjoyed working at [company name] thus far and would like to continue working for this organization from a remote location. Thank you for your consideration of this proposal.

Explanation of Software and Programs Mentioned:

**ConceptShare—www.conceptshare.com, ConceptShare allows you to set up secure online workspaces for sharing designs, documents, and video and invite others to review, comment, and give contextual feedback anytime and anywhere without a meeting. [Company name] has used this site for a few months to test its usability and has also been tested on multiple computers in Argentina (thanks to my sister*

testing it out for me while she was in Argentina).

**Skype—www.skype.com, Skype is a free software that allows you to talk for free via the Internet. You can also use Skype with regular phones to make calls internationally for a low rate of about .04 cents a minute. Skype also has video chatting capabilities and conference call capabilities for meetings. The setup requires downloading the Skype software free) and buying a headset with microphone ($10) and webcam ($ ranges) for each computer. I have tested this software with my sister and it works well for her in Argentina and for me here.*

**iStockphoto—www.istockphoto.com, iStockphoto is an Internet royalty-free image and design stock photography website. This is one of the many sites I use to find photos for [company name]. We have already used a few photos from this site for our marketing materials.*

**Seminar Photo Contest—This contest was created by me and developed with Keri as an experiment to collect more relevant and usable photos for our marketing and publication efforts. Since we have found it to be a bit invasive to try and take the photos ourselves, we wanted to try a new approach to capture photos for our needs. All participants of our Summer Seminars 2008 are able to submit photos they have taken at their seminar with a chance to be rewarded with a $5 Amazon Gift Certificate for each image we choose.*

86. This video explains how and why I pack the items in the list that follows. Links for all items are also included.

87. This company filed for Chapter 11 in June 2009.

88. For the exact breakfast, just serach "slow-carb" on www.fourhourblog.com or both "slow-carb" and "Ferriss" on Google.

89. This has thankfully decreased to 2,000–3,000 per week as of this writing.

90. This post is, of course, available on the blog for those who would like to copy and paste the rules for their own use.

Living the 4-Hour Workweek

► CASE STUDIES, TIPS, AND HACKS

- ► Zen and the Art of Rock Star Living
- ► Art Lovers Wanted
- ► Photo Finish

- ► Virtual Law
- ► Taking Flight with Ornithreads
- ► Off-the-Job Training
- ► The 4-Hour Family and Global Education
- ► Doctor's Orders
- ► Financial Musing
- ► Who Says Kids Hold You Back?
- ► Working Remotely
- ► Killing Your BlackBerry
- ► *Star Wars* , Anyone?

ZEN AND THE ART OF ROCK STAR LIVING

Hi Tim,

Here's the story. I'm a musician based in Munich, Germany. I'm running my own label and it has been difficult to get it off the ground. While working on that, my creativity slowly decreased until I hit rock bottom (a couple of times).

While it is still difficult to survive in the music industry I find it not hard at all now to do what I want to do. And that's all I do. I do what I want to do. It includes being a father, making music, composing, taking care of business, traveling, learning languages (mostly Italian), riding my bike, etc.... It's all in the following paragraphs.

1. I read the book step by step for about two months from September/October 2008 (plus surfing your blog) and just made tabula rosa with my life. (Lots of brainvomiting on paper.)
2. I started outsourcing things that bothered me most (and therefore kept hanging out in my to-do list the longest). I outsourced:

    - ► research, most of which is music-industry related (research outsourced saves about 2–3 hours/day)

- ► website maintenance (social websites like Facebook, Myspace, etc). I'm planning on doing most of my marketing through these sites in 2009 and I'm on about 25+ sites as an artist.

  My VA (getfriday.com, as recommended in your book) does all the updates and checks the sites once a week to gather e-mail messages, comments, etc., filters them and sends me a report once a week including all the details for me to respond to. (Saves about one to two hours/day.)

- ► photo retouching for my press pics is done by elance (saved five hours of work time and about $500).

- ► management of my mailing list for gig dates, album updates, etc. (Saves about one hour for each mailing.)

- ► I started testing muses (learning languages with music to sell online). I'm still testing!

- ► I decided to open a publishing operation online for film companies to license music for film with just a mouse click, without having to negotiate deals for months. It will happen in 2009 (I start testing soon). People are generally surprised and amazed that a person who doesn't seem to be very corporate (I look like a retired punk rocker, haha) outsources parts of his life and lives like a millionaire (I guess we do although we're far from it!).

I realized that I could do it after I got the first positive feedback from my outsource VA. I got the results of my project posted on elance and a day later I got the results. I went, yeah baby, this is MINE! The biggest change is, that I now have my life under control. I take care of my little daughter (20 months) half the day (second half, my wife takes care of her), I take care of business, and I take time to do things I always wanted to do. Revenue-wise I'm pretty much the same I was before but I have a lot more spare time and a clear head (so I guess I've gotten a lot richer!).

I work whenever I want (no boss) about 24–30 hours/week (including office hours and music-studio hours) and what I do now is only what I really love to do. I'm still step-by-step optimizing efficiency to reduce office hours (currently about 10 hours/week). My dream is to dissolve my office altogether, go paperless, and basically only have my laptop as an office.

I eliminated all work that has gotten me down or was wearing me out (eliminated an extra workload of about 10 hours/week). I do not take on jobs (writing/producing music) unless I really love the project. I

eliminated all complainers and haters (saves my stomach).

I just started my blog juergenreiter.com, "zen and the art of rockstarliving," where I want to share the changes I made to my life (mostly for musicians to see the light at the end of the tunnel).

And I recorded an album of my music and for the first time in my life did all the lyrics myself! It's going to be out in spring on my label ORkAaN Music+Art Productions.

I'll be on mini-retirement in New York this year for six weeks. I'll be in Sicily to learn Italian for about two weeks in May. I'll be back in Sicily to travel the island by bike for another 2–3 weeks in September. And am planning on going to either Mexico, Central America, or Australia in the winter.

I learned to shave with a straight razor within about 30 minutes, which I wanted to do for years. Shaving is a real exciting ritual now and a lot of fun! I will do a master course for coffee experts in April (I'm a coffee junky!) and become a "maestro del café." I helped my wife quit her teaching job and fulfill her dream to run a cafe in Munich, Germany. It's called Frau Viola and opened its doors in October 2008. It is running great! (www.frauviola.wordpress.com)

Can you measure all of that? I think it speaks for itself!

The general mindset of 4HWW has given me the calmness of being able to take time to play with my daughter and enjoying my "free time" without getting the fear of missing out on something or wasting my life. I'd say overall (with all the above-mentioned changes) my productivity increased at least 70% and doubt decreased by 80%.

For those just getting started:

1. start small think big.
2. identify what excites you vs. what bores you
3. eliminate and focus on what excites you
4. stick to what excites you no matter what people say. It's your life, live it the way you know is right for you.
5. read ***4-Hour Workweek***, obviously! ***—J. REITER***

ART LOVERS WANTED

I saw my father work himself to the bone for 20 years as a garbage-man when we immigrated from Mexico. As I looked at my life in April 2007 in a lonely hotel room after another endless week of travel for my employer far from my family and those I love, I realized that at 33 I was on the same path to work myself into the ground and give up on my lifelong dream of pursuing my love of music and theater.

In life there are no accidents and that night as I was checking an e-mail from an old friend he suggested the 4HWW. I devoured the book in a few hours and began immediately to apply the key principles. When I told people about the book and about what I intended to do everyone said I was crazy. I focused most of my efforts on Dream-lining, Elimination, and Liberation. As an employee I wanted to first achieve liberation with a remote work arrangement. Despite several failed attempts I persevered (great lesson in negotiating) and was granted the opportunity to work remotely. This changed everything. I went from 9+ hours of work a day with weekly work-related travel to four hours a week, one week of travel per month, and I managed to get a $10,000 raise and deliver 2x the productivity in my job from the previous unproductive year.

As a result I now live with my once long-distance girlfriend in Seattle (my hometown). I spend my newly found time pursuing my passion for music (I sing in a choir and write my own folk-rock music), theater (I am performing in my first fully improvised 60-minute play this weekend), and fitness. I am training for my second marathon now.

Most of my friends cannot believe that I can actually spend most of my time pursuing my love for the

arts and still make a full-time income on only four hours a week. The best part of this is that I have found mentally the meaning of freedom. Reality is truly negotiable and now my reality is that I can spend endless hours enjoying the company of my father, who waited twenty years till he retired to enjoy the freedom that I have found less than 24 months after reading ***The 4-Hour Workweek***.

As an immigrant I want to spread the message that to succeed in America in the 21st century we must NOT work hard, instead we must follow the principles of the 4HWW and work smarter so that we can truly achieve the New American Dream: Freedom to enjoy the most precious resource we have in life … our time on this earth.

—I. BARRON

PHOTO FINISH

Hey Tim,

I wanted to tell you that your book, ***The 4-Hour Workweek***, has been a true inspiration and life-changing resource for me this year!

I bought your book in November. Before then, I didn't know what "workflow automation" was. I had a part-time employee, but her work was actually *creating* more work for me. I would work until sometimes 3 A.M., and get up at 7. I'd tell you I wanted to travel, but the truth is that it seemed impossible to me. I didn't have time or money.

I was listening to your audio book one day. I had been listening to each of the chapters, sometimes over and over again. I was jogging. I stopped in my tracks. I believe I was listening about a case study about someone who sold music files over the Internet.

I'm a photographer. Weddings mostly. I wondered how I could sell digital images over the Internet. Then I came up with a fantastic idea for a family photography company. I stopped right there, and reserved a website on my iPhone.

Two months later, I had a website, access to thousands of photographers across the country, and our first sale. Even better, I am now in the family photography business, and I never have to shoot myself. Even better +1, we are the first family photography business that doesn't sell prints. Only digital files. It worked! I have now adopted this for my wedding photography as well. Other photographers are so offended, but I am making WAY more $, my costs are almost eliminated, and my time is free!

I know the above is vague, but it's not the point. The point is that now I work better, faster, I have two more employees, I turned off my e-mail notifications on my computer and my iPhone, despite all of what it's capable of, it doesn't even ring. E-mail has been disabled. I just check it every so often to see what calls I missed.

Today, my fiance loves me because I come home in time for dinner and I leave my laptop at work. It's a life I never thought I'd be able to live. In the meantime, systems are working in my place and this year looks to be a lot better, financially, than last.

Then I decided it was time to try my first mini-retirement. The goal: ski the Swiss Alps and spend five days in Switzerland and spend less than $1,000 total. I got a roundtrip ticket for about 500 bucks. My ski pass for one day at Engelberg was $80. Lodging was free, thanks to your suggestion www.couchsurfing.com, and I ate roasted chestnuts, brats, fish and chips and drank great beer all week long. I did it!

I am forever grateful, and am excited for more mini-retirements. Here's to living during the best years of my life.

P.S. I leave May 11 for a month-long work vacation to Italy (I have been hired to photograph two weddings in Siena). I plan on vacationing a LOT more than I will be working.

— MARK CAFIERO, Photographer

VIRTUAL LAW

I used to work at a large Silicon Valley law firm, but one day I woke up and decided that I wanted to travel for a year and learn a foreign language. Six weeks later I was living in Cali, Colombia—I'd never visited Cali before and hardly spoke a word of Spanish, but that's what made it exciting to me. Well, almost two years later, I still spend 95%+ of my time living and working from Cali, Colombia (I recently bought a gorgeous apartment here that I could never afford if I lived in California). I also have a full-time maid/cook (well, five hours per day, five days per week), which costs me less than US $40 per week!

I started my own virtual law practice and then joined forces with my old boss. My U.S. number rings through to me wherever I am in the world (originally I'm from New Zealand so I travel back there a lot, too), and all my U.S. mail is delivered to Market Street, San Francisco, and scanned so I can view it online. If I need to mail letters, I have another service which prints the letter and sends it within the U.S. so there are no international shipping delays.

Definitely use www.earthclassmail.com for mail receipt/scanning. They have different packages but it's around $20-$30/month. You can also choose one or more P.O. boxes or physical addresses. My Market Street address is actually an earthclassmail address.

For printing small letters and mailing within the U.S. I use www.postalmethods.com. It's a little clunky at first but it's fine when you get used to it. It's very cheap since you only pay when you send (a four-page letter works out to just over $1 including the postage).

Come visit me sometime. Colombia is nothing like what you hear about—I feel a lot safer walking around late at night here than a lot of places in San Francisco. But don't tell anyone, those of us living here want to keep it a secret!

—GERRY M.

TAKING FLIGHT WITH ORNITHREADS

Tim—

My mentor gave me your book this past July and it had a tremendous impact on my life, its arrival could not have had better timing. About the time I read it, I was a few weeks away from competing in my first Olympic distance triathlon. I had trained for five months, felt and looked strong, but even more important the discipline and working toward a physical goal resulted in a creativity I hadn't felt in years. I posted a competitive time in the event and felt so optimistic about my abilities that I signed up for a half ironman competition.

Riding that high and following the principles of your book, I thought of dozens of ideas for products/businesses and am on the verge of launching the first of those ideas. It is a line of apparel called OrniThreads which will provide modern, scientific designs of birds to Gen-X and Gen-Y birders.

The reasons for focusing on this demographic are twofold:

1. For my "day job," I work at [company name]. I have learned a lot about their audience/membership, e.g., like the fact that there are 70 million Americans who actively bird (a staggering statistic from the U.S. Fish & Wildlife svc). Birders are a passionate lot and their interest only seems to grow over time—it never dies! They also tend to skew from the middle to upper class and are educated.
2. I took an ornithology class this summer at Columbia University (where I am enrolled in a conservation biology program) and fell in love with the illustrations in my textbooks and wanted to surround myself with these images.

I am launching www.ornithreads.com in the next week or so and the first of my three designs are being printed as we speak.

I have big aspirations for the company, but am just trying to get the first collection to customers and learn as much as I can. Your book has been incredibly helpful in outlining the necessary steps I need to take to succeed and hope that my idea has some legs (or wings) which translates into an automated income.

If you are in NYC anytime soon—promoting your book or otherwise—I would love to meet you. Sincerely, ***—BRENDA TIMM***

OFF-THE-JOB TRAINING

I used concepts from the 4HWW to work remotely from August of '08 until January of '09. I went to Portugal, Europe, Spain, Sweden, and Norway surfing and snowboarding my brains out. Best part about it? I came home with three times as much money in the bank than I would have had if I continued the normal 9 to 5. I work for [world-famous design company] as a software developer, and was able to put the concepts to use and really change my life. I paired my iPhone + Fring (Fring is voice over IP on the iPhone, it allows you to use one device for everything, and have a local number abroad).

I spent four months prior to departure being sure to never be at my cube, but always be just around the corner. I made a point to ALWAYS be available on Instant Messenger, so when people would walk over to my cube and look for me in person they would see I was somewhere else, then hop online and ask, "Where are you?" My response was always similar, just down the hall in the cafeteria … just down the block at the coffee shop, or at co-worker X's desk. After two months of this a magical thing happened: People always looked to get me via Instant Messenger and stopped dropping by my desk altogether. That allowed me to be 6,000 miles away without anyone noticing.

Something else to consider… how **time zone** affects remote work environments. I noticed, while in Norway (nine hours away), that it was the perfect amount of time. I was, in a sense, living in the future. My day was almost over by the time my boss woke up … this allowed me to explore Norway's fjords, mountains, and undiscovered frigid surf spots in complete peace and without ever having to worry about getting a call from overseas. It was perfect … If I wanted, I could explore all day, come home and have some dinner, then ichat with my boss for 20–30 minutes and check in. The few times he needed something urgently, he was able to give me work when he went to bed, and have it completed in the morning when he woke up. ***—B. WILLIAMSON***

DOCTOR'S ORDERS

Hi Tim:

Here's my story …

My dream started about four years ago. I was in the process of taking my psychology licensing exam, and after speaking to a friend, decided that I would reward myself with a trip to South America. We were both exhausted from our 9-to-5 (and sometimes 6, 7, or 8 p.m.) hospital and clinic jobs.

I had traveled extensively throughout the United States and some parts of Europe, but I had never experienced South American culture.

My trip there was absolutely fantastic and really opened my eyes to other ways of living and culture. During my trip, I spent a lot of time speaking to expatriates about how they used their retirement funds and pensions to live the lives of kings there. One thing was evident: Most of the expatriates who attempted to "set up a business" to help fund their lifestyle had failed miserably. I hypothesized that there just wasn't enough currency (pesos) in the marketplace to really sustain a "gringo"-oriented business.

After my trip, I told my friend that I needed to dedicate all my energies to developing a method of receiving income from U.S. citizens while living elsewhere. VOIP had recently been introduced to the marketplace and Internet service was improving in South America and other parts of the third world.

The business had to be based upon absolute mobility. I boiled the whole business down to two basic functions: reliable telephone via VOIP and high-speed Internet.

At the time I had a small research consultation practice where I was helping doctoral students on the phone and via e-mail to complete their dissertations, theses, and statistical analyses. I had a small website that was getting traffic but I was relying on others for web and marketing services. I subsequently learned more about search engine optimization and web marketing and eventually took control of all web marketing and promotion of my website, http://www.ResearchConsultation.com, allowing me to expand my business substantially.

During the next three years I conducted numerous "mobile tests" … traveling to Costa Rica, the Dominican Republic, Venezuela, and Colombia in order to fine-tune my system of conducting business from abroad.

I finally left my job last November, the day before Thanksgiving, vowing to never return to the mundane 9-to-5 structure. My job had even recently instituted a "bio-metric fingerprint" identification system where you had to "punch in and out" at the beginning and end of your hospital shift with your fingerprint to ensure that you were working your eight hours. This was just another sign that I had to leave.

I now live in NYC and Colombia and travel to other parts of the world throughout the year: speaking to customers, managing my contractors (U.S. and Colombian) in order to acquire U.S. dollars while living for a fraction of the cost abroad. I'm also developing other websites and businesses (community forums) that will hopefully be more automated, requiring less day-to-day interaction and monitoring.

Well, that's my story for now … today South America, tomorrow anywhere I can get a high-speed connection (banda ancha)! My stress level has dropped significantly since leaving my old job and my quality of life has improved enormously.

My family and friends in NYC still think I'm out of my mind, and I continue to fully agree with them.... ***—JEFF B.***

THE 4-HOUR FAMILY AND GLOBAL EDUCATION

Tim,

We moved to a totally digital nomadic life traveling the world as a family in 2006, so we discovered your book and ideas after we had begun and loved it! Our life has changed totally and is more fulfilling and much more simple. We are greener, leaner, healthier, happier, more connected.

Other people thought we were absolutely nuts when we decided to do this in 2004/5, but now many of those same people think we are smart and psychic.

Problems finding a good school fit (despite having many award-winning excellent ones at our disposal) was probably the most specific moment (John Taylor Gatto says it best on why schools do not educate) that helped us to change as well as wanting more time together and forecasting the house/economy crash coming.

I think more families will be taking mini-retirements and living slower, traveling digital nomadic lives. If you are away for months as a family, you need to be informed about all the wonderful educational opportunities which are actually richer than staying home (which few realize)!

There are a TON of fantastic resources like Classroom 2.0 and many innovative educators online. My daughter just turned eight and is having a blast with her online course with John Hopkins University/CTY and it is also a nice resource for friends. Today one can immerse deeply in one culture

and still maintain one's home culture. This is important information for families who still fear the outdated negatives on Third Culture Kids (TCK) based on studies from the fifties.

Maya Frost[91] has excellent information about older kids and even a new paradigm when it comes to going to university. I think education is one of the things going through a total transition due to the Internet, and parents need this info to make important decisions.

We have had a fantastic experience in going to a local school in Spain that has allowed my child to immerse very deeply in her second language, culture, and literature. More info (in the book) on local schools is needed and how to experience it as a family for months at a time.

We have used local people like a wonderful flamenco teacher for our child and we have also used online sources like our piano teacher in Chicago who teaches our child in Spain via Skype.

E-libraries are very important (especially with a child who is a voracious reader). Http://learninfreedom.org/languagebooks.html is an excellent resource on language education with great books on raising a bilingual child, even if you are a monolingual!

—SOULTRAVELERS3, a family living abroad and loving it

FINANCIAL MUSING

I graduated from Stanford University and started working in investment banking in July 2006, and, in a sick way, almost enjoyed it at first. Yes, it was a terrible lifestyle and all, but I was learning a lot and moving up very quickly. I have (had) a type-A personality, so it appealed to me on some level.

As the year progressed, though, I realized it wasn't sustainable and that I wanted out… but like so many other people, I failed to take action immediately.

In May 2007, I was driving home at 3 A.M. one night after having pulled 4–5 all-nighters previously, and crashed into a tree on the side of the road. If you've never crashed into an inanimate object while asleep at the wheel, just imagine waking up five feet from the ground while bungee jumping as the cord is about to snap to get an idea of what it feels like.

"At the ER"

That was the subject line of the e-mail I sent out the next day to my entire office. Luckily, everyone understood and told me to take a rare three-day weekend. Luckily I survived with no major injuries, but at that point I decided it was time for a change.

I met up with some friends for dinner a week or two later and relayed my story. One friend there (who recently quit her job to pursue professional acting—her dream—while selling information products online) told me about this book she recently read called ***The 4-Hour Workweek***.

I thought it was a scam, of course, but I really hated my life and decided I needed to check it out at the very least. I read it in one sitting. And then I read it again, just to make sure I wasn't hallucinating. Before ever getting into finance, I had done some work online with graphics and web design and I had a technical background, so nothing in the book seemed outrageous to me—I just didn't realize how easy and accessible it all was. Also, I had lived in Japan for half a year in college and loved it—and long-term world travel had always been one of my goals.

I sat on the ideas in your book for a while, took a quick vacation to return to Japan in October 2007, and when I came back decided that I had to get started. My muse: sell an investment banking interview guide. It's a niche, high-demand subject and I knew I could make a better guide than anything else out there. One problem: I had to stay anonymous since I was still working, and advertising with Pay-Per-Click would be way too expensive given the high CPCs for related keywords.

In November 2007 I decided to start a blog, Mergers & Inquisitions (http://www.mergersandinquisitions.com), about the investment banking industry and how to break in, aimed at a mix of college students, MBAs, and working professionals. While I built my audience, I

never had the time to finish my muse—the interview guide. But I was getting tons of requests to do consulting from my readers, so I started with resume editing and expanded into mock interviews—yes, not very "muse-like" but I charged high rates and could make my old salary in a fraction of the time. I did this ALL while staying completely anonymous out of necessity—because I didn't want to get fired without an alternative income stream. Amazingly, my services took off even though I couldn't tell anyone who I was.

At the same time, I decided I would not get another job in finance, and would instead leave in June 2008. So I had a very short amount of time to make everything work. Almost every single one of my friends, roommates, and family doubted me and said it would never work. I decided they were all wrong and I would just do it anyway—worst-case scenario, I could always reduce my expenses and move to Thailand to teach English.

To boost my income, I completely revamped my site to sell more of my offerings, which took me from pocket change to full-time income from part-time consulting over July-August 2008. This allowed me to travel to Hawaii and Aruba to go snorkeling, surfing, and shark-cage-diving and visit friends in other parts of the U.S. all while making an investment banker's income from part-time work.

As the recession and economy worsened, my business picked up because it was counter-cyclical—anything that helps people find jobs is in huge demand in a poor economy. I've since helped scores of laid-off bankers and other financiers find work elsewhere. However, I was also starting to work a lot more because I was effectively trading time for money … so over the fall I started to work on my original product idea—my interview guide—and released it to great success later in 2008.

It has gone on to free up a ton of time, double my revenues, and put the majority of my income on autopilot. If I didn't do any further work from this point onward, I could make 2–3x my previous monthly income simply by writing once or twice a week for my site (4–5 hours) and doing limited consulting on the side (10 hours). So you could say I've increased my income almost 3x while reducing my hours 6x-9x and making myself completely mobile.

I admit that often I do "work" more than this, but it's all on related educational projects that I want to work on, not anything that I have to work on. And if I don't feel like working one week, I can reduce my hours to the 5–15 hour range and spend my time on learning languages, sports, or traveling to exotic destinations.

This setup allowed me to take an amazing trip to China, Singapore, Thailand, and Korea in December-January and get in some ridiculous adventures. I'll be moving to Asia in a few months and after that, traveling the world indefinitely while running my business from coffee shops.

Incidentally, I met up with a lot of customers in Asia who thought this was the coolest thing ever!

Your book has changed my life and infinitely improved my lifestyle, and I just wanted to thank you for everything.

—B. DECHESARE

WHO SAYS KIDS HOLD YOU BACK?

My first action was to think "what is the worst that can happen on a scale of 1–10" if I quit my well-paid, very secure government job? The power of this thought process is incredible.

I quit my job, sold my house, and went camping for three months with two kids under two and a half and a pregnant wife (mini-retirement). We (very slowly) drove the SE coast of Australia from Sydney to Adelaide.

With the complete clarity of mind that comes from being in a field with your family with no immediate worries, I put into action a plan that I had been tinkering with for 12 months. I bought a wireless Internet dongle and created an info product for electrical engineers, and wrote some software to

go with it.

Managed this by (a) going on info diet, (b) working 9 p.m.-midnight in a campsite with no other distractions, (c) outsourcing everything that I would find difficult or time consuming (like the tricky programming stuff and the illustrations for my book).

After about four weeks I had an automated informational website that had replaced ½ of my full-time income—requiring > four hours per week to maintain.

The original plan was to arrive in Adelaide and get a J.O.B. But with my passive income, I decided to simply grow my new business and am currently very close to replacing 100% of my previous income. It feels f&*#ing brilliant.

Now we plan to travel the world slowly until the kids are ready for primary school…

Who says kids hold you back?! ***—FINN***

WORKING REMOTELY

One month and one year ago, I read 4HWW on the recommendation of my sister's boyfriend after I had been talking for months about changing my life drastically and moving to Argentina to learn Castellano. After reading the book I stopped talking about my dreams and immediately started setting short-term and long-term goals. I bought a notebook to track my monthly goals and tasks. I did lots of research on potential remote working situations and I started telling my close friends and family about my new plans. Everyone that I told thought it was just an idea and I wasn't actually going to go through with it. They thought it was a "some day I'd like to do this" idea and that I wasn't actually setting daily goals to get me there. They knew that I loved my job so why would I leave it for a life of uncertainty? I didn't think of it that way. I wasn't scared, I was excited at the prospect of a new way of life, a fresh start, and even though I loved my job I also had other things I wanted to accomplish in my life. At first I thought about teaching English to make a living down there, but deep down inside all I really wanted to do was continue working for my current company, just doing it remotely. The book gave me the confidence to think this was actually possible, when everyone around me thought it was impossible.

I decided to write up a proposal[92] and present it to my boss even at the advice not to do it from everyone I knew. If my boss rejected my proposal, I had enough money saved up to live in Argentina for at least six months to get me by until I could figure out how I wanted to make money there. I was not giving up on my dream of living a freer, happier life with less work and more time for myself. All odds were against me but I took a calculated risk and had faith in myself. After I handed in my proposal, I was ready to expect the worst. Everyone around me was waiting with baited breath and words of encouragement after I got rejected. When I left the meeting with my boss I couldn't believe it. She accepted and was eager to talk to me about the details. She even had a smile on her face and told me how awesome my proposal was. No one else could believe it when I told them. After the shock wore off, I realized that I could actually do this, and a huge weight was lifted from my shoulders. The hardest part was over and now I could start thinking of more possibilities for my new life.

I set my goal to move to Argentina for September 2008. I arrived here on September 3 and have been here for about six months now. I live in the capital city of Jujuy, Argentina, a small province in the northwest of Argentina. I work about 5–10 hours a week and I find that I am much more focused now that I am out of the office and working alone. I have a private Spanish tutor that I meet with for two hours, five days a week. I have a handful of friends that I spend time with, practicing my Spanish. I go to the gym three times a week and go to yoga two times a week—something I didn't do in the States because I didn't have enough time. I eat healthier because I have more time to focus on what to eat. I have more time to dream up bigger things that I want to do with my new free time. I have dreams of owning a bar or cafe, so maybe a few years from now that will be my next endeavor.

My advice to 4HWW readers is to take from my experience. I rely heavily on the advice of my friends

and family, but sometimes you have to ignore the advice of your loved ones to really make some thing happen. If you believe the impossible can be made possible, it will happen. ***—A.K. BROOKMIRE***

KILLING YOUR BLACKBERRY

I'm a 37-year-old Subway franchisee owning and operating 13 stores. Been doing this for seven years. Prior to reading 4HWW I was KING at W4W (translate: work for work's sake)! I'd never given myself "permission" to behave differently than I did as an employee in the past. 4HWW was absolutely liberating for me. I literally "caught myself" and began the process of curing my addiction to W4W. I used to always be "on" and I was never really "present" anywhere—too busy doing the "blackberry prayer" at the dinner table instead of spending quality time with those who were present. Holidays were just a remote office for battling the e-mail tsunami. 4HWW gave me a new paradigm and I began to look at my business as a "product," the (original) purpose of which was to provide me with a disproportionate amount of income vs. time invested personally by me—to what end? To ENJOY MYSELF and to have complete autonomy over my schedule and activities. So I got off my own back, told myself it was OK to pursue the original purpose and here's what I did:

Crunched my "always open" workweek into four days and 20 hours. I immediately began taking Mondays OFF, giving me a nice three-day weekend. (Fridays are in the "CROSSHAIRS" next!) Tuesday to Friday I work 11 A.M.-4 p.m. (20 hours per week). With the "unluxury" of time in this crunched workweek I was forced to appraise everything through the 80/20 filter and found that 50% of the 80% was pure crap and the other 50% of the 80% could be done by someone on my payroll. Great!

Everything I do now has to somehow either increase sales or decrease costs otherwise "it's someone else's job." You can't be "half-pregnant," so when I'm "on" I'm really on and when I'm "off" I'm off—good luck trying to contact me. I still carry portable e-mail but I've killed "auto-sync" (the bane of modern mankind in terms of interruption) now it's on a Tues-Fri, 11 A.M.-4 p.m. schedule. Outside of that window it waits.

My e-mail autoresponder eliminated 50% of my e-mail within two weeks as people sending me meaningless crap got fed up looking at my autoresponder and stopped including me—love it! I keep a short, compact "to-do" list and anything time-bound is in my calendar. These get my attention before any other "inbox" does because I've previously decided what's important for me to get done—the rest can wait.

I could go on, but all in all I think this is a message that the self-employed need to hear so badly. With no "boss" and no "clean edges" to work-life/home-life it's so easy to fall into a W4W grind and your business becomes a tractor beam that trails you inexorably down that path. 4HWW is the antidote!" ***—ANDREW, self-employed in the UK***

STAR WARS , ANYONE?

I knew my quest for the 4-Hour Workweek was working when my daughter's kindergarten teacher asked her the question: "What kind of work does your father do?" As the teacher re-told the story back to me, it was my daughter's answer that really struck a chord. "Your daughter turned and looked up at me with the most serious look on her face and said, 'My dad just sits around and watches *Star Wars* all day.'"

It's funny how this one simple question, and not to mention my daughter's answer, would be the moment of true 4HWW self-awareness for me. You see the answer my daughter gave her teacher has a deeper meaning. I believe what she meant to say, if she could articulate it, was "My dad sort of does whatever he wants to do."

I read the 4HWW almost two years ago when I was on vacation at the beach with my family. I remember it well, because I kept reading parts of the book to my wife, bothering her to no end. I am a

developer and enterprise administrator for a large financial institution in Atlanta, Georgia. Part of my job is supporting the large complex document captures systems that I help build. Due to the importance of these systems I am expected to be reachable 24/7/365. That is good for job security, but can be bad for my family life. I have four beautiful children and I strive to be a true "hands-on" dad who is present in my family's daily lives. So armed with your book and a fresh (ocean air) perspective, I set out to put many of the 4HWW principles into practice.

First, I worked on changing my e-mail habits. I took a hard look at my inbox and used several of the techniques outlined in the 4HWW to eliminate all the waste and noise. I formed new habits around batching my e-mail sessions and it didn't take long to achieve a zero inbox using the "trusted trio" folder method. I also applied the less is more philosophy to composing my e-mails. I went to great lengths to ensure I am as clear and concise as possible. Only communicating exactly what is needed to the right audience and not to the world. By eliminating all the noise and fat from my e-mail diet it became much more clear what "actions" or "to-do's" were important.

Meetings and conference calls were the next area of attack. I scrutinized each meeting invite and began declining requests left and right. Most of the time I would claim I had too much going on to attend. I started asking for the minutes of the meeting or for someone to IM me if they had a specific question I needed to answer. When I do attend a meeting it is almost always via a conference call. Due to conference room restrictions and geographic challenges in our company most of our meetings are done virtually anyway.

Less wasted time meant more time to focus on work and tasks that really mattered. I felt like I was doing less but getting more things done and with better results. The right people were starting to notice and the perception of my ability to get the job done had never been better. I was making my management look good, and when that happens they stop asking questions or micromanaging daily activities. I kept proving to them I can do it without interference. Now was the time to make the push for what I really wanted and that was to go virtual!

Going virtual was actually very easy. I had a solid foundation with my manager and others in the chain of command. Almost all of my daily work was already remote-ready. At home, I have a great dedicated office in our finished basement. It is situated well away from the rest of the house and is mostly free of distractions. I have my own bathroom with shower and I even have a mini-fridge and microwave. I dare say that my home office rivals the amenities of the top executives at my company. Most of all, I have a wife and family that totally understand and respect the rules I set for myself to continue this success.

At first, I worked one or two days a week from home, but it didn't take long before I found myself working four out of five days a week from home. When the Southeast was hit by the gas shortage and the price of gas nationwide was cresting $4 a gallon, the company made working from home even more accepted and official. I became an overnight model for others to follow. As people around me were in a panic as to how to get to work when no gas could be found, I was happily working away at home just business as usual.

At this point, things were working better than I ever expected. Using my 4HWW skills I now had more time to be that hands-on dad I wanted to be. I became a regular up at the elementary school. I eat lunch in the cafeteria with my girls, especially on fried chicken day! I participate in a program called D.E.A.R. which stands for Drop Everything and Read, where a few times a month I come in and read to each class. I drive my kids to school and I get to see them when they come home. For my entire family, I am present in their everyday lives, and can't put a price on that. I felt like I had achieved my goal. That was that. So I thought…

Other things started to happen. Without conscientiously knowing it, people around me at the school or church had a weird respect for me. I say weird because people literally mistook me as a doctor or just some sort of self-made millionaire. I am not kidding. There is this one guy who still calls me "Doc." I guess the reason for this is because most people still cling to the old stereotypes of what they think it is

to be "rich." I always seem to show up for the school functions or just special days at the school, usually in casual attire and never obsessing over time or my Blackberry. Now I have people nominating me for things like committee chair on the PTA, and just recently I was elected to the board of directors at our local swim/ tennis club. The cool thing is, I actually have the time to do those things and still be effective at work and at home. It goes without saying that new doors are open to me now. More than ever before.

With all of this going on around me I still come back to what my daughter said to her teacher. In truth, I am at a point where if I wanted to "sit around and watch *Star Wars* all day," I certainly could. But, I find myself filling the extra time now doing things that really mean something. Being present in the everyday lives of my family, helping my community, or volunteering at my church. Now I have a plan to take it to the next level and write my own book. The project I am working on is called *The Virtual Employee Handbook*. It is a collection of tips and how-to's on all the tools that are essential to the modern virtual employee, like me. We will see how that goes. One thing I do know is that I wouldn't even dream of what I am doing now if it wasn't for ***The 4-Hour Workweek!*** ***—W. HIGGINS***

91. Maya Frost, *The New Global Student* (Crown, 2009).

92. A simple, actual proposal is provided.

► RESTRICTED READING
The Few That Matter

A hypocrite is a person who—but who isn't?

—DON MARQUIS

I know, I know. I said not to read too much. Hence, the recommendations here are restricted to the best of the best this book's interviewees and I have used and named when asked, "What is the one book that changed your life the most?"

None of them are required to do what we've talked about in this book. That said, consider them if you get stuck on a particular point. The page counts are listed, and if you practice the exercises in "How to Read 200% Faster in 10 Minutes" in Chapter 6, you should be able to read at least 2.5 pages per minute (100 pages thus equals 40 minutes).

For additional categories, including practical philosophy, licensing, and language learning, be sure to visit our comprehensive companion site.

The Fundamental Four: Let Me Explain

The Fundamental Four are so named because they are the four books I recommended to aspiring lifestyle designers prior to writing *The 4-Hour Workweek*. Still well worth reading, here is the sequence I suggest:

The Magic of Thinking Big (192 pages)

BY DAVID SCHWARTZ

This book was first recommended to me by Stephen Key, an ultrasuccessful inventor who has made millions licensing products to companies, including Disney, Nestlé, and Coca-Cola. It is the favorite book of many superperformers worldwide, ranging from legendary football coaches to famous CEOs, and has more than 100 5-star ratings on Amazon. The main message is don't overestimate others and underestimate yourself. I still read the first two chapters of this book whenever doubt creeps in.

How to Make Millions with Your Ideas: An Entrepreneur's Guide (272 pages)

BY DAN S. KENNEDY

This is a menu of options for converting ideas into millions. I read this when I was in high school and have read it five times since. It is like steroids for your entrepreneurship cortex. The case studies, from Domino's Pizza to casinos and mail-order products, are outstanding, even if outdated in a few instances.

The E-Myth Revisited: Why Most Small Businesses Don't Work and What to Do About It (288 pages)

BY MICHAEL E. GERBER

Gerber is a masterful storyteller and his classic of automation discusses how to use a franchise mind-set to create scalable businesses that are based on rules and not outstanding employees. It is an excellent road map—told in parable—for becoming an owner instead of constant micromanager. If you're stuck in your own business, this book will get you unstuck in no time.

Vagabonding: An Uncommon Guide to the Art of Long-Term World Travel (224 pages)

BY ROLF POTTS

Rolf is the man. This is the book that got me to stop making excuses and pack for an extended hiatus. It covers bits of everything but is particularly helpful for determining your destination, adjusting to life on the road, and re-assimilating back into ordinary life. It includes great little excerpts from famous vagabonds, philosophers, and explorers, as well as anecdotes from ordinary travelers. This is the first of two books (the other was *Walden*, below) that I took with me on my first 15-month mini-retirement.

Reducing Emotional and Material Baggage

Walden (384 pages)

BY HENRY DAVID THOREAU

This is considered by many to be *the* masterpiece of reflective simple living. Thoreau lived on the edge of a small lake in rural Massachusetts for two years, building his own shelter and living alone, as an experiment in self-reliance and minimalism. It was both a huge success and a failure, which is what makes this book such a compelling read.

Less Is More: The Art of Voluntary Poverty—An Anthology of Ancient and Modern Voices in Praise of Simplicity (336 pages)

EDITED BY GOLDIAN VANDENBROECK

This is a collection of bite-sized philosophies on simple living. I read it to learn how to do the most with the least and eliminate artificial needs, not live like a monk—big difference. It incorporates actionable principles and short stories ranging from Socrates to Benjamin Franklin and the Bhagavad Gita to modern economists.

The Monk and the Riddle: The Education of a Silicon Valley Entrepreneur (192 pages)

BY RANDY KOMISAR

This great book was given to me by Professor Zschau as a graduation gift and introduced me to the phrase "deferred-life plan." Randy, a virtual CEO and partner at the legendary Kleiner Perkins, has been described as a "combined professional mentor, minister without portfolio, in-your-face investor, trouble-shooter and door opener." Let a true Silicon Valley wizard show you how he created his ideal life using razor-sharp thinking and Buddhist-like philosophies. I've met him—he's the real deal.

The 80/20 Principle: The Secret to Success by Achieving More with Less (288 pages)

BY RICHARD KOCH

This book explores the "nonlinear" world, discusses the mathematical and historical support for the 80/20 Principle, and offers practical applications of the same.

Muse Creation and Related Skills

Harvard Business School Case Studies **www.hbsp.harvard.edu (click on "school cases")**

One of the secrets behind Harvard Business School's teaching success is the case method—using real-life case studies for discussion. These cases take you inside the marketing and operational plans of 24-Hour Fitness, Southwest Airlines, Timberland, and hundreds of other companies. Few people realize that you can purchase these case studies for less than $10 apiece instead of spending more than $100,000 to go to Harvard (not that the latter isn't worth it). There is a case study for every situation, problem, and business model.

"This business has legs": How I Used Infomercial Marketing to Create the $100,000,000 Thighmaster Craze: An Entrepreneurial Adventure Story (206 pages)

BY PETER BIELER

This is the story of how a naïve (in the best sense of the word) Peter Bieler started from scratch—no product, no experience, no cash—and created a $100-million merchandising empire in less than two years. It is a mind-expanding and often hysterical case study that uses real numbers to discuss the fine points of everything from dealing with celebrities to marketing, production, legal, and retail. Peter can now finance the media purchases for your product: www.mediafunding.com.

Secrets of Power Negotiating: Inside Secrets from a Master Negotiator (256 pages)

BY ROGER DAWSON

This is the one negotiating book that really opened my eyes and gave me practical tools I could use

immediately. I used the audio adaptation. If you're hungry for more, William Ury's *Getting Past No* and G. Richard Shell's *Bargaining for Advantage: Negotiation Strategies for Reasonable People* are outstanding. These are the only negotiating books you'll ever need.

Response Magazine **(www.responsemagazine.com)**

This magazine is dedicated to the multibillion-dollar direct response (DR) industry, with a focus on television, radio, and Internet marketing. How-to articles (increasing sales per call, lowering media costs, improving fulfillment, etc.) are interspersed with case studies of successful campaigns (George Foreman Grill, *Girls Gone Wild*, etc.). The best outsourcers in the business also advertise in this magazine. This is an excellent resource at an excellent price—free.

Jordan Whitney Greensheet **(www.jwgreensheet.com)**

This is an insider secret of the DR world. Jordan Whitney's weekly and monthly reports dissect the most successful product campaigns, including offers, pricing, guarantees, and ad frequencies (indicative of spending and, thus, profitability). The publication also maintains an up-to-date tape library from which infomercials and spot commercials can be purchased for competitive research. Highly recommended.

Small Giants: Companies That Choose to Be Great Instead of Big (256 pages)

BY BO BURLINGHAM

Longtime *Inc*. magazine editor-at-large Bo Burlingham crafts a beautiful collage and analysis of companies that focus on being the best instead of growing like cancer into huge corporations. Companies include Clif Bar Inc., Anchor Stream Microbrewery, rock star Ani DiFranco's Righteous Babe Records, and a dozen more from different industries. Bigger is not better, and this book proves it.

Negotiating World Travel and Preparing for Escape

Six Months Off: How to Plan, Negotiate, and Take the Break You Need Without Burning Bridges or Going Broke (252 pages)

BY HOPE DLUGOZIMA , JAMES SCOTT , AND DAVID SHARP

This was the first book to make me step back and say, "Holy sh*t. I can actually do this!" It steamrolls over most fear factors related to long-term travel and offers a step-by-step guide to taking time off to travel or pursue other goals without giving up your career. Full of case studies and useful checklists.

Verge Magazine **(http://vergemagazine.com)**

This magazine, formerly known as *Transitions Abroad*, is *the* central hub of alternative travel and offers dozens of incredible options for the non-tourist. Both the print and online versions are great starting points for brainstorming how you will spend your time overseas. How about excavating in Jordan or eco-volunteering in the Caribbean? It's all here.

From the website: "Each issue takes you around the world with people who are doing something different and making a difference doing it. This is the magazine resource for those wanting to volunteer, work, study, or adventure overseas."

► BONUS MATERIAL

This book is not just what you hold in your hands. There was much more I wanted to include but couldn't due to space constraints. Use passwords hidden in this book to access some of the best I have to offer. Here are just a few examples that took me years to assemble:

How to Get $250,000 of Advertising for $10,000
(includes real scripts)

How to Learn Any Language in 3 Months

Muse Math: Predicting the Revenue of Any Product
(includes case studies)

Licensing: From Tae Bo to Teddy Ruxpin

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► About the Author

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Crime Victims' Rights During Criminal Investigations? Applying the Crime Victims' Rights Act Before Criminal Charges Are Filed

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CRIME VICTIMS' RIGHTS DURING CRIMINAL INVESTIGATIONS?

APPLYING THE CRIME VICTIMS' RIGHTS ACT BEFORE CRIMINAL CHARGES ARE FILED

PAUL G. CASSELL*

NATHANAEL J. MITCHELL&**

BRADLEY J. EDWARDS***

This Article addresses whether crime victims should have rights during criminal investigations, using the Crime Victims' Rights Act (CVRA) as the focal point for our discussion. This is a critical issue, as many criminal cases may never proceed to formal charging. If crime victims have no rights during criminal investigations, then many crime victims will never have any rights at all.

The issue of whether crime victims have rights in the criminal justice process recently came to a head when the Justice Department released a memorandum contending that the CVRA does not extend crime victims any rights until prosecutors choose to file formal criminal charges. This led the CVRA's Senate cosponsor, then-Senator Jon Kyl, to fire off an angry letter to the Justice Department attacking its position. In our Article, we side with the Act's cosponsor. We believe that, properly understood, the CVRA does extend crime victims' rights during criminal investigations.

Our Article proceeds in four parts. First, it highlights the importance of applying the Act before the formal filing of charges by illustrating how dozens of victims in a notorious federal sex abuse case were deprived of the

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ability to participate meaningfully in the criminal process when federal prosecutors narrowly interpreted their responsibilities under the Act. Second, the Article reviews the purpose, text, structure, and history of the CVRA, concluding that they all support the conclusion that crime victims have rights during criminal investigations. Third, our Article critiques the Department's memorandum, demonstrating that the Department's analysis is unpersuasive. Fourth and finally, the Article provides a specific approach for determining when rights should attach—specifically when federal law enforcement agencies have identified a crime with sufficient precision to send a "target" letter to a criminal defendant. We also observe that federal and state prosecutors have already accorded rights to victims before formally filing charges, which further undermines the Department's overly narrow construction of the Act.

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INTRODUCTION

In recent years, federal and state enactments have given crime victims extensive rights to participate in criminal cases. Many of these rights apply only after the filing of criminal charges, such as the victim's right to be heard during court proceedings. A crime victim's right to deliver an impact statement at sentencing, for instance, can only be exercised after a prosecutor has filed charges against a defendant and obtained a conviction. Other rights, however, can apply even before the formal filing of charges. As one example, the Crime Victims' Rights Act (CVRA)[1] extends to federal crime victims the right to "confer" with prosecutors. But can victims exercise this right before charges have been filed?

This question has tremendous practical importance. In many cases, prosecutors negotiate pleas well before any charges are ever drafted. If crime victims' rights enactments do not extend rights to victims until the formal filing of charges, then crime victims can be effectively excluded from the plea bargaining process. Yet the exclusion of victims in early stages of a criminal case affects more than just the content of a plea deal. Crime victims will also lose other important rights in the process if the formal filing of charges is the necessary trigger for those rights. If, for example, prosecutors work out a nonprosecution agreement with an offender, they need not notify his victims of what they are doing or of the fact that potential charges will never be filed.

The issue of pre-charging rights has most prominently surfaced in connection with federal cases. In 2010, the Department of Justice's Office of Legal Counsel (OLC) weighed in on the issue and released a legal opinion arguing that victims of federal crimes have no CVRA rights during a federal criminal investigation.[2] The Justice Department took the position that rights under the CVRA do not apply until prosecutors formally initiate criminal proceedings by filing a complaint, information, or indictment. The Department claims to find support for that limiting interpretation of the statute in its plain language and legislative history.

Shortly after the Department released its opinion, one of the CVRA's congressional sponsors, then-Senator Jon Kyl, sent a letter to Attorney General Eric Holder strenuously objecting to the Department's conclusions. Senator Kyl directly stated his view that "[w]hen Congress enacted the

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[1] Scott Campbell, Stephanie Roper, Wendy Preston, Louarna Gillis, and Nila Lynn Crime Victims' Rights Act, Pub. L. No. 108-405, 118 Stat. 2260, 2261–65 (2004) (codified as amended at 18 U.S.C. § 3771 (2012) and 42 U.S.C. § 10603(d)–(e) (2006)).

[2] The Availability of Crime Victims' Rights Under the Crime Victims' Rights Act of 2004, 35 Op. O.L.C. 1 (Dec. 17, 2010) [hereinafter OLC CVRA Rights Memo], *available at* http://goo.gl/fHmCL4.

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CVRA, it intended to protect crime victims throughout the criminal justice process—from the investigative phases to the final conclusion of a case."[3] Senator Kyl contested the Department's analysis of the statute and, in particular, its use of statements from him during Congress's consideration of the CVRA.

This Article sides with the CVRA's cosponsor and concludes that crime victims' CVRA rights attach before formal charging. Both the CVRA's plain language and its legislative history lead inexorably to this conclusion, as every court that has considered this issue has concluded. This Article also contends that, as a matter of sound public policy, crime victims should have rights before the formal filing of criminal charges.

This Article proceeds in four parts. Part I frames the issues under discussion by defending the importance of extending rights to crime victims during criminal investigations. Part I also provides background on victims' rights and gives a concrete illustration of a case in which the question of pre-charging rights for crime victims has arisen—specifically, the Jeffrey Epstein sex abuse case before a federal court in Florida. In that case, girls victimized by Epstein have argued that they should have been consulted about a federal nonprosecution agreement; Department attorneys have responded that because prosecutors never filed charges, government officials had no formal obligations to inform the girls.

Part II reviews the CVRA's purpose, text, structure, and legislative history. This review establishes that the CVRA extends rights to crime victims before formal charges are filed.

Part III critiques OLC's position that the CVRA extends rights to victims only after prosecutors have lodged charges in court. The Department's proffered arguments do not withstand close scrutiny, particularly in light of the fact that the CVRA covers federal agencies involved in the "detection" and "investigation" of crime,[4] and specifically authorizes crime victims to file CVRA motions in situations where "no prosecution is underway."[5]

Part IV then proposes a specific approach for determining when crime victims' CVRA rights attach. This Part explains that the rights should attach when federal law enforcement or prosecuting agencies have identified a federal crime and a particular victim with sufficient precision that they would send a "target" letter to a criminal defendant in similar circumstances. If prosecutors have sufficient information to provide notice

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[3] Letter from Jon Kyl, U.S. Sen., to Eric H. Holder, Jr., Att'y Gen. (June 6, 2011), *reprinted in* 157 CONG. REC. S3608 (daily ed. June 8, 2011) (statement of Sen. Jon Kyl).

[4] 18 U.S.C. § 3771(c)(1).

[5] *Id.* § 3771(d)(3).

to a potential criminal of his rights, they can do the same for his victims. This Part also notes that the Department of Justice and state prosecutors already successfully provide rights to victims before charging. This successful experience strongly suggests that providing rights to victims early in the criminal justice process will not be unduly burdensome.

I. THE ISSUE OF RIGHTS FOR CRIME VICTIMS DURING CRIMINAL INVESTIGATIONS

To consider the question of whether victims should have rights during criminal investigations, some understanding of the underlying purposes of victims' rights enactments will be useful. These enactments are typically designed to make victims participants in all phases of the criminal justice process.[6] Congress drafted the CVRA, for example, broadly to make crime victims participants in criminal cases. The Jeffrey Epstein sex abuse case demonstrates the importance of victim participation even before charges are filed.

A. A BRIEF HISTORY OF CRIME VICTIMS' RIGHTS

The crime victims' rights movement has sought to make crime victims important participants in the criminal justice process. The movement began in the wake of the Warren Court revolution, which extended new rights to criminal defendants.[7] With the courts paying increasing attention to criminal defendants, crime victims' advocates began to argue that the victims themselves had been overlooked.[8] The movement gained great visibility in the early 1980s when President Ronald Reagan appointed the President's Task Force on Victims of Crime.[9] The Task Force published a report concluding that "the criminal justice system has lost an essential balance. . . . The victims of crime have been transformed into a group oppressively burdened by a system designed to protect them. This oppression must be redressed."[10]

The Task Force chronicled how crime victims were treated in all stages of the criminal justice process, from the police investigation through

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[6] *See* DOUGLAS E. BELOOF, PAUL G. CASSELL & STEVEN J. TWIST, VICTIMS IN CRIMINAL PROCEDURE 3–39 (3d ed. 2010) (describing reforms from a historical perspective); *see also, e.g.*, 18 U.S.C. § 3771(a) (2012).

[7] *See* BELOOF, CASSELL & TWIST, *supra* note 6, at 3–39 (describing the history of victims' rights in American law and the early days of the modern movement).

[8] *See, e.g.*, William F. McDonald, *Towards a Bicentennial Revolution in Criminal Justice: The Return of the Victim*, 13 AM. CRIM L. REV. 649, 651–55 (1976).

[9] Exec. Order 12,360, 47 Fed. Reg. 17,975 (Apr. 27, 1982); *see also* PRESIDENT'S TASK FORCE ON VICTIMS OF CRIME, FINAL REPORT, at ii (1982).

[10] PRESIDENT'S TASK FORCE ON VICTIMS OF CRIME, FINAL REPORT, *supra* note 9, at 114.

court proceedings, and ultimately to any parole or other release of the criminal. The Task Force then made a series of recommendations for all criminal justice agencies, including the police, prosecutors, and the courts.[11] The recommendations were designed to allow crime victims to receive information about, and to participate in, criminal cases.

In its most far-reaching recommendation, the Task Force proposed amending the U.S. Constitution to protect victims' rights.[12] The proposed amendment would have built on existing constitutional rights for criminal defendants by extending similar rights to crime victims.[13]

After the publication of the report, crime victims' advocates secured the passage of a series of state constitutional and legislative reforms. These measures guaranteed victims' rights in the criminal process, such as the right to be notified of court proceedings, to attend those proceedings, and to speak at appropriate points in the process, such as plea bargaining and sentencing. The measures were embodied in state statutes and, in more than thirty states, state constitutional "bills of rights" for crime victims.[14] While many of the measures had narrow participatory rights,[15] some of the amendments also contained more open-ended language, promising victims a right to fair treatment "throughout the criminal justice process."[16]

After successfully passing many state constitutional amendments, crime victims' rights advocates sought to achieve the Task Force's broadest recommendation: to secure protection for victims' rights in the U.S. Constitution. In 1996, victims' advocates proposed a Victims' Rights Amendment in a Rose Garden ceremony attended by President Bill Clinton.[17] The proposed amendment contained a list of rights for crime victims, largely paralleling the rights contained in state victims' rights

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[11] *See id.* at 56–82.

[12] *Id.* at 114.

[13] *Id.* at 114–15.

[14] For a map depicting the states with (and without) such amendments, see *State Victim Rights Amendments*, NAT'L VICTIMS' CONSTITUTIONAL AMENDMENT PASSAGE, http://goo.gl/znI4YW (last visited Nov. 26, 2013); for discussion, see *infra* Part IV.D (discussing legislative reforms in a number of states).

[15] *See, e.g.*, CAL. CONST. art. I, § 28; MICH. CONST. art. I, § 24; N.C. CONST. art. I, § 37. For a detailed discussion of how one state constitutional amendment is intended to operate, see generally Paul G. Cassell, *Balancing the Scales of Justice: The Case for and the Effects of Utah's Victims' Rights Amendment*, 1994 UTAH L. REV. 1373.

[16] *E.g.*, ARIZ. CONST. art. II, § 2.1(A)(1); MICH. CONST. art. I, § 24(1); TEX. CONST. art. I, § 30(a)(1); *see* CAL. CONST. art. I, § 28(b)(1) ("throughout the criminal or juvenile justice process").

[17] John M. Broder, *Clinton Calls for Victims' Rights in Constitution*, L.A. TIMES, June 26, 1996, at A1. For detailed discussions of the legislative efforts, see Paul G. Cassell, *Recognizing Victims in the Federal Rules of Criminal Procedure: Proposed Amendments in Light of the Crime Victims' Rights Act*, 2005 BYU L. REV. 835, 847–50.

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amendments.[18] Congress considered the amendment several times, but it never obtained the requisite two-thirds support in both houses to secure the Amendment's approval.[19] Critics quarreled not so much with the goals of the amendment but rather with the necessity of constitutionalizing such rights.[20]

B. THE CRIME VICTIMS' RIGHTS ACT

Unable to obtain the necessary supermajority to pass a federal constitutional amendment, in April 2004, crime victims' rights advocates decided to focus on federal legislation protecting crime victims. In exchange for backing off from their efforts to pass a constitutional amendment, crime victims' advocates received near-universal congressional support for a "broad and encompassing" statutory victims' bill of rights.[21] Victims' advocates sought to expand on the protections found in other previously-enacted victims' rights statutes, including, notably, the Victims' Rights and Restitution Act of 1990.[22] That statute had also included a bill of rights for crime victims, yet because of limited enforcement mechanisms, crime victims had been unable to secure court protection of the rights listed in the statute.[23]

The statute that Congress passed to solve these problems—the Crime Victims' Rights Act of 2004—gave victims "the right to participate in the

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[18] *See* Cassell, *supra* note 17, at 848–49. For the pros and cons of the amendment as originally introduced, compare Paul G. Cassell, *Barbarians at the Gates? A Reply to the Critics of the Victims' Rights Amendment*, 1999 UTAH L. REV. 479 [hereinafter Cassell, *Barbarians at the Gates?*], and Steven J. Twist, *The Crime Victims' Rights Amendment and Two Good and Perfect Things*, 1999 UTAH L. REV. 369, with Robert P. Mosteller, *The Unnecessary Victims' Rights Amendment*, 1999 UTAH L. REV. 443. For a more recent discussion of a newer version of the amendment, see Paul G. Cassell, *The Victims' Rights Amendment: A Sympathetic, Clause-by-Clause Analysis*, 5 PHOENIX L. REV. 301 (2012).

[19] Hon. Jon Kyl et al., *On the Wings of Their Angels: The Scott Campbell, Stephanie Roper, Wendy Preston, Louarna Gillis, and Nila Lynn Crime Victims' Rights Act*, 9 LEWIS & CLARK L. REV. 581, 588–91 (2005).

[20] *Proposed Constitutional Amendment to Protect Crime Victims*, *S.J. Res. 1: Hearing Before the S. Comm. on the Judiciary*, 108th Cong. 128–29 (2003) (statement of Sen. Patrick Leahy); *see also* Steven J. Twist & Daniel Seiden, *The Proposed Victims' Rights Amendment: A Brief Point/Counterpoint*, 5 PHOENIX L. REV. 341, 356, 378 (2012) (illustrating that the necessity dispute has endured to the present day).

[21] 150 CONG. REC. 7295 (2004) (statement of Sen. Dianne Feinstein); *see also* Kyl et al., *supra* note 19, at 591–93.

[22] Victims' Rights and Restitution Act of 1990, Pub. L. No. 101-647, 104 Stat. 4820 (codified as amended at 42 U.S.C. §§ 10601, 10606–07 (2006)).

[23] *See, e.g.*, United States v. McVeigh, 106 F.3d 325, 328 (10th Cir. 1997) (per curiam) (refusing to enforce a victim's right to attend a trial); Cassell, *Barbarians at the Gates?*, *supra* note 18, at 515–22 (discussing *McVeigh*).

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system."[24] It extended broad rights to crime victims, including "[t]he right to be treated with fairness and with respect for the victim's dignity and privacy"[25] and "[t]he reasonable right to confer with the attorney for the Government in the case."[26] It also commanded that these rights must be afforded by the Justice Department "and other departments and agencies of the United States engaged in the detection, investigation, or prosecution of crime."[27] The CVRA also contained specific enforcement mechanisms. The Act provided that rights can be "assert[ed]" by "[t]he crime victim or the crime victim's lawful representative, and the attorney for the Government . . . ."[28] The courts were also required under the Act to "ensure that the crime victim is afforded the rights" given by the law.[29]

Congress appeared to have at least two goals in mind in passing the CVRA. The first was simply to ensure that crime victims understood what was happening in the criminal justice process. This goal is apparent from the fact that the CVRA gives crime victims rights to notification about various court hearings, as well as more general rights to confer with prosecutors and to be treated with fairness.[30] The CVRA's Senate sponsors explained:

> In case after case we found victims, and their families, were ignored, cast aside, and treated as non-participants in a critical event in their lives. They were kept in the dark by prosecutors to[o] busy to care enough, by judges focused on [defendants'] rights, and by a court system that simply did not have a place for them.[31]

In passing the CVRA, Congress sought to change the system's obliviousness to crime victims that often "left crime victims and their families victimized yet again."[32]

A second overarching purpose of the CVRA was to allow crime victims to play a role in the criminal justice process. Through the CVRA, Congress intended to make victims "independent participant[s]" in the criminal justice process.[33] The CVRA extends to crime victims a series of "rights" in the criminal justice process—rights that the victims have

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[24] 150 CONG. REC. 7297; *see* 18 U.S.C. § 3771 (2012). For a description of victim participation, see BELOOF, CASSELL & TWIST, *supra* note 6, at 728–33.

[25] 18 U.S.C. § 3771(a)(8).

[26] *Id.* § 3771(a)(5).

[27] *Id.* § 3771(c)(1).

[28] *Id.* § 3771(d)(1).

[29] *Id.* § 3771(b)(1).

[30] *See id.* § 3771(a).

[31] 150 CONG. REC. 7296 (2004) (statement of Sen. Dianne Feinstein).

[32] *Id.*

[33] *Id.* at 7302 (statement of Sen. Jon Kyl).

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independent standing to assert.[34] Congress viewed these provisions as establishing a victim's right "to participate in the process where the information that [victims] and their families can provide may be material and relevant . . . ."[35]

Congress appears to have had both intrinsic and instrumental reasons for wanting crime victim participation. Congress clearly thought that such participation was valuable in its own right. Senator Kyl embodied this belief and explained his decision to become involved in the crime victims' rights movement because of his discovery that victims:

> were suffering through the trauma of the victimization and then being thrown into a system which they did not understand, which nobody was helping them with, and which literally prevented them from participation in any meaningful way. I came to realize there were literally millions of people out there being denied these basic rights . . . .[36]

But Congress also thought crime victim participation in the criminal justice system could be instrumentally useful. For example, in protecting a victim's right to be heard by those determining a defendant's sentence, a victim might be able to provide important information that could alter that sentence. As a result, the sentence might reflect a fuller appreciation of the danger posed by a defendant, and the judge might take appropriate steps to prevent others from being victimized.[37]

Congress also intended to ensure that crime victims were not revictimized in the criminal justice process—that is, that they would not suffer what scholars have called "secondary harm" in the process.[38] The concern is that victims suffer when they are excluded from the criminal justice process. Congress sought to end that suffering by making victims meaningful participants in criminal cases.[39]

C. AN ILLUSTRATION OF THE PRE-CHARGING ISSUE: THE JEFFREY EPSTEIN CASE

Given the potentially expansive scope of victims' rights under both state provisions and the CVRA, a critical question arises about how to apply them: Do the rights come into existence only after prosecutors formally file

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[34] *Compare* 18 U.S.C. § 3771(d), *with* Susan Bandes, *Victim Standing*, 1999 UTAH L. REV. 331, 344–45 (illustrating the debate surrounding victim standing prior to adoption of the CVRA).

[35] 150 CONG. REC. 7296 (statement of Sen. Dianne Feinstein).

[36] *Id.* at 7298 (statement of Sen. Jon Kyl).

[37] *Id.*

[38] *See, e.g.*, Douglas Evan Beloof, *The Third Model of Criminal Process: The Victim Participation Model*, 1999 UTAH L. REV. 289, 294–96; Richard A. Bierschbach, *Allocution and the Purposes of Victim Participation Under the CVRA*, 19 FED. SENT'G REP. 44, 46 (2006).

[39] 150 CONG. REC. 7298 (statement of Sen. Jon Kyl).

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criminal charges? Or do they attach at some earlier point in the process? *Does v. United States*, a federal case in the U.S. District Court for the Southern District of Florida, usefully illustrates the issue.[40] In that case, the U.S. Attorney's Office for the Southern District of Florida developed considerable evidence that Jeffrey Epstein, a billionaire with extensive political and social connections,[41] had sexually molested more than thirty young girls between 2001 and 2007 at his West Palm Beach mansion.[42] The U.S. Attorney's Office entered into contentious plea negotiations with Epstein over how the case should be resolved. The prosecutors initially sought a resolution that would have required Epstein to plead guilty to at least a felony sex offense. After pressure from Epstein, for reasons that have never been clearly explained,[43] the U.S. Attorney's Office agreed to enter into a nonprosecution agreement. Under the agreement, the U.S. Attorney's Office agreed not to prosecute him and, in exchange, Epstein agreed to plead guilty to two state felonies for soliciting prostitution with a minor. After entering those guilty pleas, Epstein was sentenced to only eighteen months in state jail.[44] No federal charges were ever filed and

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[40] Does v. United States, 817 F. Supp. 2d 1337 (S.D. Fla. 2011). In the interest of full disclosure, two of the authors of this Article (Cassell and Edwards) are co-counsel for the victims in this case. The statement of the facts in this Article draws heavily on the victims' allegations as they have detailed in their pending motion for summary judgment in the case. *See* Jane Doe #1 & Jane Doe #2's Motion for Finding of Violations of the Crime Victims' Rights Act and Request for a Hearing on Appropriate Remedies at 3–23, *Does*, 817 F. Supp. 2d 1337 (No. 9:08-cv-80736-KAM) [hereinafter Jane Doe Motion] (providing fifty-three proposed facts in the case). The U.S. Attorney's Office has generally disputed some of these allegations without offering specifics as to what happened. *See, e.g.*, United States' Response to Jane Doe #1 & Jane Doe #2's Motion for Finding of Violations of the Crime Victim Rights Act and Request for a Hearing on Appropriate Remedies at 34–43, *Does*, 817 F. Supp. 2d 1337 (No. 9:08-cv-80736-KAM) [hereinafter United States' Response]. As of this writing, Epstein has declined to intervene in the case to dispute the allegations.

[41] *See, e.g.*, Paul Harris, *Prince Andrew's Link to Sex Offender Jeffrey Epstein Taints Royalty in US*, GUARDIAN (Mar. 12, 2011), http://goo.gl/0I4vAE; Landon Thomas Jr., *Jeffrey Epstein: International Moneyman of Mystery*, N.Y. MAG., http://goo.gl/11Cayc (last visited Nov. 26, 2013).

[42] *See* Jane Doe Motion, *supra* note 40, at 3–4; Abby Goodnough, *Questions of Preferential Treatment Are Raised in Florida Sex Case*, N.Y. TIMES, Sept. 3, 2006, at A19.

[43] The U.S. Attorney responsible for the plea deal later revealed that after negotiations started, "[w]hat followed was a year-long assault on the prosecution and the prosecutors" by Epstein. Letter from R. Alexander Acosta, former U.S. Att'y, to Whom It May Concern (Mar. 20, 2011), *reprinted in* Conchita Sarnoff, *Behind Pedophile Jeffrey Epstein's Sweetheart Deal*, DAILY BEAST (Mar. 25, 2011, 3:17 AM), http://goo.gl/kyveiF. Acosta, however, claimed that the pressure did not influence the ultimate disposition of the case. *Id.*

[44] Landon Thomas Jr., *From Paradise to County Jail: A Billionaire Financial Adviser Will Serve 18 Months in Sex Case*, N.Y. TIMES, July 1, 2008, at C1.

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Epstein spent much of the jail term on "work release" to his luxurious office.[45]

The U.S. Attorney's Office did not tell Epstein's victims about the nonprosecution agreement until well after it had taken effect. To the contrary, even after the nonprosecution agreement had been signed, the Office continued to tell the victims that the case was still "under investigation" and that they should be "patien[t]."[46] When the victims learned of the agreement, two of them (Jane Doe Number One and Jane Doe Number Two) filed suit in federal court under the Crime Victims' Rights Act, arguing that the prosecutors had violated their CVRA right to confer as well as their right to be treated fairly.[47] The victims contended that prosecutors should have conferred with them about the nonprosecution agreement before it became final.

In response, the U.S. Attorney's Office argued primarily that it was under no obligation to extend the victims any rights under the CVRA. It was the Government's blunt position that "CVRA rights do not attach in the absence of federal criminal charges filed by a federal prosecutor."[48] In short, the Government argued it was not required to confer in any way with the victims, or even treat them fairly, because the CVRA was not yet in play. The issue is thus squarely framed: Is the Government correct in its assertion that it has no CVRA obligations in cases like the Epstein case where federal prosecutors never lodged federal charges against a suspect? In view of the CVRA's prominence, resolution of this issue may shed important light on the nature of crime victims' enactments and the breadth of the role that crime victims should have in the criminal justice process.

II. THE CVRA'S APPLICATION BEFORE FORMAL CHARGES ARE FILED

To analyze the issue of whether the CVRA extends rights to crime victims before prosecutors have formally filed charges, it is useful to look at the CVRA's purposes, language, and judicial interpretations. This Part looks at each of these three issues in turn.

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[45] *See* Michele Dargan, *Feds Say They Treated Epstein Victims Fairly*, PALM BEACH DAILY NEWS (Apr. 8, 2011, 7:23 PM), http://goo.gl/rTGDed; Conchita Sarnoff, *Billionaire Pedophile Goes Free*, DAILY BEAST (July 20, 2010, 7:05 PM), http://goo.gl/MSTi17.

[46] *See* Jane Doe Motion, *supra* note 40, at 14, 16 (internal quotation marks and citations omitted).

[47] *See* Emergency Victim's Petition for Enforcement of Crime Victim's Rights Act, 18 U.S.C. Section 3771 at 2, Does v. United States, 817 F. Supp. 2d 1337 (S.D. Fla. 2011) (No. 9:08-cv-80736-KAM).

[48] United States' Response, *supra* note 40, at 7.

A. THE CVRA'S PURPOSES

An analysis of the CVRA's application before prosecutors have filed charges must begin by assessing the CVRA's purposes because any interpretation of the CVRA that is divorced from the statute's purposes would run the risk of defeating the statute's aims. It is axiomatic that courts should "give faithful meaning to the language Congress adopted in the light of the evident legislative purpose in enacting the law in question."[49]

As discussed above,[50] one important goal of the CVRA was to keep crime victims informed about any developments in the criminal justice process. But the need to be informed does not begin with the filing of a formal criminal charge. A crime victim needs to know what is happening before formal charging—during a criminal investigation, for example—just as much as she needs to know what is happening in court. Indeed, she may have a greater need to know, as she may be concerned that the criminal who harmed her is still on the loose, posing a danger to her.

Similarly, concerning the second purpose—facilitating victim participation[51]—without a right to pre-charging involvement, victims may be effectively shut out of the process entirely. The Epstein case provides a useful illustration of why the CVRA must be understood to extend rights to victims prior to indictment. The prosecutors handling the investigation reached an agreement with Epstein that barred federal prosecution of sex offenses committed against dozens of victims, including Jane Doe Number One and Jane Doe Number Two. If CVRA rights did not extend to the negotiations surrounding the agreement, then the victims *never* would have had any ability to participate in the resolution of the case.[52]

A construction of the CVRA that extends rights to victims before charges are filed would be entirely consistent with the CVRA's participatory purpose. If victims have the ability to participate in a pre-charging plea bargaining process, for example, victims can help ensure that prosecutors do not overlook anything that should be covered in the plea deal. For example, victims might be able to obtain agreement to a "no contact" order or valuable restitution—points that the prosecutor might fail

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[49] Graham Cnty. Soil & Water Conservation Dist. v. United States *ex rel.* Wilson, 130 S. Ct. 1396, 1409 (2010) (quoting United States v. Bornstein, 423 U.S. 303, 310 (1976)) (internal quotation marks omitted).

[50] *See supra* notes 24–27.

[51] *See supra* notes 28–29.

[52] Even the Justice Department seems to recognize this point. As a matter of policy, the Department extends to victims the right to confer with prosecutors in situations where plea discussions occur before charges have been brought. U.S. DEP'T OF JUSTICE, OFFICE FOR VICTIMS OF CRIME, ATTORNEY GENERAL GUIDELINES FOR VICTIM AND WITNESS ASSISTANCE 41–42 (2011 ed., rev. May 2012) [hereinafter ATTORNEY GENERAL GUIDELINES].

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to consider in crafting a plea. Similarly, allowing victims to participate early in the process avoids retraumatizing victims. Again, as the Epstein case usefully illustrates, it may be extremely difficult for victims to discover after the fact that potential criminal charges against a criminal who has abused them have been secretly bargained away. Jane Doe Number One and Jane Doe Number Two, for example, were outraged when they discovered prosecutors had entered into an agreement blocking any prosecution of sex offenses Epstein committed against them—and all without telling them.[53]

In short, the purposes animating the CVRA all suggest that the Act was meant to, and should, extend rights to crime victims before formal charges are filed.

B. THE CVRA'S PLAIN LANGUAGE

While the general purposes of the CVRA support a broad interpretation of the Act, it is important to examine whether those purposes have been expressed in the Act's language. Without a linkage to the Act's text, the general purpose might not provide a sound basis for interpretation.[54] But the CVRA's plain language makes clear that Congress intended for the law to provide at least some rights to crime victims throughout the criminal justice process, even before the filing of criminal charges.

According to its text, the CVRA provides eight specifically enumerated rights for crime victims and an additional right to be reasonably notified of these rights.[55] Some of these rights presuppose the formal filing of criminal charges. For instance, the CVRA extends to victims the "right to reasonable, accurate, and timely notice of any public court proceeding."[56] That particular right obviously does not apply before charges are filed, as no "court proceedings" exist before a defendant is charged.

But the CVRA also promises crime victims rights that are not specifically tied to court proceedings. Perhaps most expansively, the CVRA guarantees victims the "right to be treated with fairness and with

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[53] Without disclosing confidential attorney–client communications, this fact is readily apparent from victims' filings in the Epstein case. *See, e.g.*, Jane Doe Motion, *supra* note 40, at 17 (stating that the victims relied on the U.S. Attorney's Office representatives "to their detriment[,]" that if they knew the true facts, "they would have taken steps to object" to the plea agreement, and that they believed criminal prosecution to be "extremely important").

[54] *See* ANTONIN SCALIA & BRYAN A. GARNER, READING LAW: THE INTERPRETATION OF LEGAL TEXTS 56 (2012).

[55] 18 U.S.C. § 3771(a) (2012) (enumerating eight rights); *id.* § 3771(c)(1) (requiring government officers use "their best efforts" to notify victims of their rights).

[56] *Id.* § 3771(a)(2).

respect for the victim's dignity and privacy,"[57] a broad right that does not appear to be directly linked to a filed court case. Similarly, the CVRA promises victims the "reasonable right to confer with the attorney for the Government *in the case*."[58] In this section, the CVRA's drafters appear to have eschewed a reference to court proceedings, using a broader term instead. Of course, a "case" can refer both to a judicial case before a court and an investigative case pursued by a law enforcement officer. It is common usage to say such things as, "The police officer investigated and solved the case." Dictionary definitions of the word "case" support this varied interpretation.[59]

If there remained any doubts about whether the CVRA applies during the investigative part of the criminal justice process, two other provisions in the CVRA resolve them. The CVRA specifically directs that "[o]fficers and employees of the Department of Justice and other departments and agencies of the United States engaged in the *detection*, *investigation*, or prosecution of crime shall make their best efforts to see that crime victims are notified of, and accorded, the rights described in [the CVRA]."[60] Of course, there would be no reason to direct that agencies involved in the "detection" and "investigation" of crime have CVRA obligations if the Act did not extend to pre-charging situations. Congress thus directly envisioned the victims' rights law to apply during the "detection" and "investigation" phases of criminal cases.

Similarly, the CVRA's venue provision instructs that crime victims who seek to assert rights in pre-charging situations should proceed in the court where the crime was committed: "The rights described in subsection (a) [of the CVRA] shall be asserted in the district court in which a defendant is being prosecuted for the crime or, *if no prosecution is underway*, in the district court in the district in which the crime occurred."[61] Here again, it is hard to see why this provision would be necessary unless the CVRA applies before the formal filing of charges.

For all these reasons, the CVRA's plain language indicates that the victims have protected rights under the Act even before charges are filed.

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[57] *Id.* § 3771(a)(8).

[58] *Id.* § 3771(a)(5) (emphasis added).

[59] *See, e.g.*, BLACK'S LAW DICTIONARY 243–44 (9th ed. 2009) (defining, among the definitions of "case," a "test case" as "[a] criminal investigation" as in "the Manson case"); WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE UNABRIDGED 345 (1993) (defining "case" as "a circumstance or situation (as a crime) requiring investigation or action by the police or other agency").

[60] 18 U.S.C. § 3771(c)(1) (emphasis added).

[61] *Id.* § 3771(d)(3) (emphasis added).

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C. COURTS RECOGNIZE THAT CRIME VICTIMS HAVE CVRA RIGHTS BEFORE CHARGING

Because crime victims lack a right to appointed counsel, many victims have difficulty litigating the scope of their rights.[62] But in a few cases, victims have been able to secure counsel to argue that they have rights in the criminal justice process during the investigation of federal crimes. When those cases have reached the issue of whether the CVRA applies before charges have been filed, courts have uniformly agreed with the victims' position.

Perhaps the leading case to date to assess this question is the Fifth Circuit's decision in *In re Dean*.[63] There, a wealthy corporate criminal defendant reached a generous plea deal with the Government—a deal that the Government filed for approval with the district court without conferring with the victims. Citing procedural rights under the CVRA, the victims requested that the trial court reject the plea agreement.[64] The District Court for the Southern District of Texas specifically concluded that victims' CVRA rights could apply during the investigation of the crime: "There are clearly rights under the CVRA that apply before any prosecution is underway."[65] The district court concluded, however, that the Government had not violated the CVRA because it had secured judicial permission to dispense with notification to victims.[66]

The victims sought appellate review in the Fifth Circuit.[67] There, the court concurred with the district court that CVRA rights apply before trial. Unlike the district court, however, it held that the Government had violated the victims' rights:

> The district court acknowledged that "[t]here are clearly rights under the CVRA that apply before any prosecution is underway." Logically, this includes the CVRA's establishment of victims' "reasonable right to confer with the attorney for the Government." At least in the posture of this case (and we do not speculate on the

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[62] John W. Gillis & Douglas E. Beloof, *The Next Step for a Maturing Victim Rights Movement: Enforcing Crime Victim Rights in the Courts*, 33 McGEORGE L. REV. 689, 693 (2002).

[63] 527 F.3d 391 (5th Cir. 2008). Other aspects of the case are discussed in Paul G. Cassell & Steven Joffee, *The Crime Victims' Expanding Role in a System of Public Prosecution: A Response to the Critics of the Crime Victims' Rights Act*, 105 NW. U. L. REV. COLLOQUY 164, 172–76 (2011).

[64] *In re Dean*, 527 F.3d at 392.

[65] United States v. BP Prods. N. Am. Inc., No. H-07-434, 2008 WL 501321, at *11 (S.D. Tex. Feb. 21, 2008).

[66] *Id.* at *1, *19.

[67] For discussion of the difficulties crime victims face to obtain appellate review of their claims, see generally Paul G. Cassell, *Protecting Crime Victims in Federal Appellate Courts: The Need to Broadly Construe the Crime Victims' Rights Act's Mandamus Provision*, 87 DENV. U. L. REV. 599 (2010).

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> applicability to other situations), the government should have fashioned a reasonable way to inform the victims of the likelihood of criminal charges and to ascertain the victims' views on the possible details of a plea bargain.[68]

The Fifth Circuit then remanded the matter to the district court to determine the appropriate remedy for the violation of the victims' rights.[69]

The Fifth Circuit's decision in *Dean* has been cited favorably in four recent district court decisions, which provides further support for the conclusion that the CVRA applies before charges have been filed. In *United States v. Rubin*,[70] victims of a federal securities fraud argued that they had CVRA rights even before prosecutors filed a superseding indictment covering the specific crimes affecting the victims. Citing *Dean*, the District Court for the Eastern District of New York agreed that the rights were expansive and could apply before charges were filed but were subject to the outer limit that the Government has at least "contemplated" charges.[71]

Similarly, in *United States v. Oakum*,[72] the District Court for the Eastern District of Virginia considered a claim that CVRA rights did not apply until after a defendant had been convicted. In rejecting that argument, the court agreed with the *Dean* court that victims acquire rights even before a prosecution begins.[73]

The District Court for the Northern District of Indiana held to the same effect in *In re Petersen*.[74] There, the court held that a victim's right to be treated with fairness and with respect for [his or her] dignity and privacy "may apply before any prosecution is underway and isn't necessarily tied to a 'court proceeding' or 'case.'"[75] The court, however, found that the "conclusory allegations" in the victims' petition did not "create a plausible claim for relief under the CVRA."[76]

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[68] *In re Dean*, 527 F.3d at 394 (internal citations omitted).

[69] *Id.* at 396. On remand, the district court held additional hearings in which the victims participated, satisfying their CVRA rights. *See* United States v. BP Prods. N. Am. Inc., 610 F. Supp. 2d 655, 660 (S.D. Tex. 2009).

[70] 558 F. Supp. 2d 411 (E.D.N.Y. 2008).

[71] *Id.* at 419 (internal citation omitted). *Rubin*'s suggestion about limitations that apply to pre-indictment assertions of rights is discussed at notes 184–187 and 193 *infra* and accompanying text.

[72] No. 3:08cr132, 2009 WL 790042 (E.D. Va. Mar. 24, 2009).

[73] *Id.* at *2.

[74] No. 2:10-CV-298 RM, 2010 WL 5108692 (N.D. Ind. Dec. 8, 2010).

[75] *Id.* at *2 (citing *In re* Dean, 527 F.3d 391, 394 (5th Cir. 2008); United States v. BP Prods. N. Am. Inc., H-07-434, 2008 WL 501321 (S.D. Tex. Feb. 21, 2008)).

[76] *Id.* *Petersen* also held that one specific CVRA right—the right to confer—only applies after charges have been filed. *Id.* But the authorities *Petersen* cites for that proposition prove no such thing. Confusingly, *Petersen* cited the Fifth Circuit's ruling in

Perhaps the most extensive discussion of this issue has come from the Epstein case discussed earlier.[77] Overruling the Government's argument that the CVRA only applies after the formal filing of charges, *Does v. United States* held that "the statutory language clearly contemplates pre-charge proceedings."[78] The court in *Does* explained that "[c]ourt proceedings involving the crime are not limited to post-complaint or post-indictment proceedings, but can also include initial appearances and bond hearings, both of which can take place before a formal charge."[79] The court also noted that the CVRA's "requirement that officials engaged in 'detection [or] investigation' [of crimes] afford victims the rights enumerated in subsection (a) surely contemplates pre-charge application of the CVRA."[80] Finally, the court in *Does* noted that "[i]f the CVRA's rights may be enforced before a prosecution is underway, then, to avoid a strained reading of the statute, those rights must attach before a complaint or indictment formally charges the defendant with the crime."[81]

In sum, the relevant case law unanimously agrees that the CVRA extends rights to crime victims before charges have been filed.

III. THE JUSTICE DEPARTMENT'S UNPERSUASIVE POSITION

Despite the CVRA's broad remedial purposes, its expansive language referring to investigations, and the unanimous case law extending rights to victims prior to defendants being charged, the OLC released a memorandum in 2011 concluding that CVRA rights attach only "from the time that criminal proceedings are initiated (by complaint, information, or indictment)."[82] OLC's analysis is unpersuasive. Although OLC's opinion

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Dean for support; but (as just explained above) *Dean* held exactly the opposite. Similarly, *Petersen* cites other cases involving the right to confer after charges have been filed. *Id.* But none of these cases actually presented the issue of the CVRA's application to pre-indictment situations, since charges had already been filed in each of these cases. *See, e.g.*, *In re* Stewart, 552 F.3d 1285, 1289 (11th Cir. 2008).

[77] Does v. United States, 817 F. Supp. 2d 1337 (S.D. Fla. 2011).

[78] *Id.* at 1341.

[79] *Id.*

[80] *Id.* at 1342.

[81] *Id.* Recently, the district court in the *Does* case also rejected Government efforts to dismiss the action. The district court found that, if the victims could prove the factual allegations they have made, then they would be entitled to relief, including potentially the relief of invalidating the nonprosecution agreement that Epstein obtained from the Government. Does v. United States, No. 9:08-cv-80736-KAM, 2013 WL 3089046, at *3 (S.D. Fla. June 19, 2013).

[82] OLC CVRA Rights Memo, *supra* note 2, at 1. Although the opinion is dated December 17, 2010, it was publicly released on May 20, 2011. *See* Letter from Jon Kyl, *supra* note 3.

invokes the CVRA's definition of crime "victim," its legislative intent, and its structure, a closer reading of each demonstrates little support for the notion that crime victims must await the formal filing of charges before accruing CVRA rights.

A. OLC'S MISREADING OF THE CVRA'S DEFINITION OF "VICTIM"

OLC's lead argument is that the CVRA's definition of "victim" presupposes that criminal charges have been formally filed.[83] The CVRA defines a "victim" who is protected as "a person directly and proximately harmed as a result of the commission of a Federal *offense*."[84] Focusing on the word "offense," OLC concedes that it does not "conclusively resolve" the question of when rights attach. Nevertheless, OLC claims that the word "naturally suggests that a person's status as a 'crime victim' can only be determined after there has been a formal decision to charge a defendant with a particular Federal offense."[85] OLC goes on to elaborate:

> Under this reading, the earliest that a "crime victim" under the Act could be identified would be upon the filing of a criminal complaint—that is, at the earliest point at which there is a sworn written statement of probable cause to believe that a particular defendant committed an identified Federal offense and hence the first point at which it is possible with any certainty to identify a "crime victim" directly and proximately harmed by the commission of that offense.[86]

OLC is disingenuous in asserting that the "first point" at which a person has been harmed by a federal crime arises only after a criminal complaint has been filed. The Department routinely makes such determinations at earlier points in criminal cases, such as when it sends a "target letter" to a defense attorney during a grand jury investigation.[87] Indeed, OLC remarkably ignores the fact that the Department is directly *required* to identify victims of a crime before the filing of a criminal complaint, both by statute and through internal policy directives.

The Victims' Rights and Restitution Act of 1990 (VRRA)[88] requires the Department to identify victims before the filing of a criminal complaint.

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[83] OLC CVRA Rights Memo, *supra* note 2, at 6.

[84] 18 U.S.C. § 3771(e) (2012) (emphasis added).

[85] OLC CVRA Rights Memo, *supra* note 2, at 5.

[86] *Id.*

[87] A target letter explains the procedural process underlying an indictment and places the defendant on notice of the general nature of the government's criminal investigation. *See* U.S. DEP'T OF JUSTICE, TITLE 9: U.S. ATTORNEYS' CRIMINAL RESOURCE MANUAL § 160, [hereinafter CRIMINAL RESOURCE MANUAL] *available at* http://goo.gl/YHLDke (providing an example target letter); *infra* Part III.A (developing this point further).

[88] Pub. L. No. 101-647, 104 Stat. 4820 (codified as amended at 42 U.S.C. §§ 10601, 10606–07 (2006)).

Passed in 1990, the VRRA provided crime victims with a set of procedural rights similar to those found in the CVRA, along with rights to notification about victim services.[89] In 2004, the CVRA repealed and replaced the section of the VRRA listing procedural rights, while leaving other parts of the VRRA intact.[90] Under the remaining parts of the VRRA, the Justice Department must inform victims of federal crimes of services that are available to them, including "emergency medical and social services," counseling, and support.[91] The Department is further obligated to keep victims fully informed about "the status of the investigation of the crime, to the extent it is appropriate to inform the victim and to the extent that it will not interfere with the investigation."[92] These rights to notice about "emergency medical and social services"[93] as well as to the "status of the investigation of the crime"[94] obviously require the Department to identify victims of federal crimes before formal charges have been filed. Indeed, the VRRA makes this point clear by directing the Department to not only notify the victim about the status of the investigation but also about the later "filing of charges against a suspected offender."[95] The VRRA then extends victims' rights to information through the rest of the criminal justice process by requiring the Department to provide notice to victims of such things as the imposed sentence and the defendant's release.[96]

The VRRA not only requires the Department to identify victims during the investigation of a crime, it also defines those victims in a very similar fashion to the CVRA. The VRRA defines "victim" as a "person that has suffered direct physical, emotional, or pecuniary harm as a result of the commission of a crime."[97] Thus, the Department is already routinely identifying persons who have been "harmed" by federal crimes shortly after the commission of those crimes and well before formal charging.

The Attorney General has also promulgated internal guidelines requiring Justice Department components to identify victims rapidly after a crime. The *Attorney General Guidelines for Victim and Witness Assistance* provide that "Department responsibilities to crime victims begin as soon as possible after the detection of a crime at which they may be undertaken

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[89] *See supra* notes 22–23 and accompanying text.

[90] Justice for All Act of 2004, Pub. L. No. 108-405, § 102(a), 118 Stat. 2260, 2261 (2004) (codified at 18 U.S.C. § 3771(a) (2012)).

[91] *See* 42 U.S.C. § 10607(c).

[92] *Id.* § 10607(c)(3)(A).

[93] *Id.* § 10607(c)(1)(A).

[94] *Id.* § 10607(c)(3)(A).

[95] *Id.* § 10607(c)(3)(C).

[96] *Id.* § 10607(c)(3)(G).

[97] *Id.* § 10607(e)(2).

without interfering in the investigation. Generally, this point in time is defined by the opening of a criminal investigation."[98]

Given the way the two statutes work, it would make no sense to artificially confine the CVRA's reach until after the filing of a criminal complaint. Before then, victims will have often received information from the Department about the status of the investigation. They might wish to confer with prosecutors about how the case is proceeding, and the CVRA extends to them a right to confer.[99] Similarly, while the Department is notifying victims about the services they may receive and the status of an investigation, it is important that the victims be treated fairly. The CVRA extends the right to be treated fairly.[100] Indeed, it would be absurd to think that Congress wanted to permit the Justice Department to treat crime victims unfairly until criminal charges have been filed.

Instead of recognizing Congress's intent, OLC's 2011 memorandum simply cites to a series of cases in which courts concluded that a victim of uncharged conduct should not be afforded statutory protections.[101] Yet none of these cases—*United States v. Turner*,[102] *Searcy v. Paletz*,[103] or *Searcy v. Skinner*[104]—provide strong support for OLC's position. *Turner* is a particularly poor fit. Although OLC's memorandum characterizes *Turner* as excluding victims of uncharged conduct,[105] the magistrate judge adopted an inclusive reading of the statute precisely because of his reservations about the CVRA's legislative history and plain language. The judge suggested that "any person who self-identifies as [a victim]" could be presumed to qualify for protection under the CVRA as a preliminary matter.[106] In fact, the line quoted by the Department is lifted out of context. The full sentence reads: "While the offense charged against a defendant can

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[98] ATTORNEY GENERAL GUIDELINES, *supra* note 52, at 7 (internal citations omitted); *see also* 42 U.S.C. § 10607(b).

[99] 18 U.S.C. § 3771(a)(5) (2012) (preserving "[t]he reasonable right to confer with the attorney for the Government in the case").

[100] *Id.* § 3771(a)(8) (preserving "[t]he right to be treated with fairness and with respect for the victim's dignity and privacy").

[101] OLC CVRA Rights Memo, *supra* note 2, at 6 n.6.

[102] 367 F. Supp. 2d 319 (E.D.N.Y. 2005).

[103] No. 6:07-1389-GRA-WMC, 2007 WL 1875802 (D.S.C. June 27, 2007).

[104] No. 6:06-1418-GRA-WMC, 2006 WL 1677177 (D.S.C. June 16, 2006).

[105] OLC CVRA Rights Memo, *supra* note 2, at 6 n.6.

[106] *Turner*, 367 F. Supp. 2d at 327 ("Instead, I have taken and will continue to follow an inclusive approach: absent an affirmative reason to think otherwise, I will presume that any person whom the government asserts was harmed by conduct attributed to a defendant, as well as any person who self-identifies as such, enjoys all of the procedural and substantive rights set forth in § 3771.").

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serve as a basis for identifying a 'crime victim' as defined in the CVRA, the class of victims with statutory rights may well be broader."[107]

Paletz and *Skinner* similarly provide scant support for the Department's position. In *Skinner*, a prison inmate attempted to bring a pro se *civil* suit against another inmate for allegedly attacking him during incarceration.[108] In dismissing the suit in an unpublished decision, the district court recognized that the Government had expressly declined to bring charges against the other inmate and concluded that the CVRA did not create a "mechanism to bring an action against Defendant directly."[109] In *Paletz*, that same inmate brought a similar pro se claim against another inmate, the Federal Bureau of Prisons, the FBI, and the U.S. Attorney General.[110] In a parallel, unpublished decision, the district court dismissed the suit, noting that the CVRA is designed to give victims certain rights "within the prosecutorial process against a criminal defendant."[111]

Because *Skinner* and *Paletz* involve (apparently frivolous) *civil* suits, they say nothing about the CVRA's reach in criminal cases, and any language to that effect would be pure dicta. Moreover, the courts' terse analysis in both cases does not contain any substantive discussion of whether CVRA rights apply in criminal cases before the filing of charges. Instead, the courts simply cited to language from a Second Circuit decision that stated that the CVRA does not give victims any rights against defendants until those defendants have been convicted[112]—a holding clearly limited to restitution, as many other CVRA rights clearly apply before conviction.[113] Reviewing these two cases in an extended, published opinion, the U.S. District Court for the Southern District of Texas noted that reading these two decisions as standing for the proposition that charges must be filed for CVRA rights to attach "appears inconsistent with the CVRA recognition of certain subsection (a) rights that apply during investigation, before any charging instrument is filed."[114] As a result, OLC

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[107] *Id.* at 326.

[108] *Skinner*, 2006 WL 1677177, at *1–2.

[109] *Id.* at *2.

[110] Searcy v. Paletz, No. 6:07-1389-GRA-WMC, 2007 WL 1875802, at *1–2 (D.S.C. June 27, 2007).

[111] *Id.* at *2.

[112] *Id.* ("However, 'the CVRA does not grant victims any rights against individuals who have not been convicted of a crime.'" (quoting *In re* W.R. Huff Asset Mgmt. Co., 409 F.3d 555, 564 (2d Cir. 2005))).

[113] Of course, a defendant cannot be ordered to pay restitution as part of his sentence until he has been found guilty. *See* 18 U.S.C. § 3664 (2012) (describing sentencing procedures for ordering restitution).

[114] United States v. BP Prods. N. Am. Inc., No. H-07-434, 2008 WL 501321, at *12 n.7 (S.D. Tex. Feb. 21, 2008).

vastly overstates its position when it asserts that "most courts . . . have declined to extend enforceable rights under the CVRA to alleged victims of conduct that did not lead to criminal proceedings."[115] All the courts that have actually reached the issue have concluded exactly the opposite.[116]

B. OLC'S DISTORTION OF THE CVRA'S STRUCTURE AND LEGISLATIVE HISTORY

The next section of OLC's memorandum maintains that the CVRA's structure and legislative history lead to the conclusion that the CVRA is "best understood" as extending rights after charges have been filed. Here again, OLC's analysis is truncated at best and misleading at worst.

OLC begins this part of its analysis by observing that some of the rights in the CVRA are limited to court proceedings. OLC notes, for example, that the CVRA gives victims the "right to reasonable, accurate, and timely notice of any public *court proceeding* . . . involving the crime."[117] But the fact that some of the rights listed in the CVRA apply to court proceedings hardly means that all of the rights are to be so restricted. The federal criminal justice process includes stages that are pre-charging, post-charging, and post-conviction. It would hardly be surprising to find that a statute that Congress intended to be "broad and encompassing"[118] covered events occurring after the filing of charges.

Indeed, OLC appears to recognize that at least three of the rights listed in the CVRA could easily apply before charges are filed: (1) the "right to be reasonably protected from the accused"; (2) the "reasonable right to confer with the attorney for the Government in the case"; and (3) the "right to be treated with fairness and with respect for the victim's dignity and privacy."[119] None of these rights explicitly refer to court "proceedings" or other events (such as parole hearings) that necessarily occur after the filing of formal charges.[120]

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[115] OLC CVRA Rights Memo, *supra* note 2, at 5–6. Notably, the Department does not embrace the language from *Huff* found within the *Skinner* and *Paletz* decisions because presumably such an approach would be contrary to many of the rights found in the CVRA.

[116] *See infra* Part I.C.

[117] OLC CVRA Rights Memo, *supra* note 2, at 6 (emphasis added) (quoting 18 U.S.C. § 3771(a)(2)).

[118] 150 CONG. REC. 7295 (2004) (statement of Sen. Dianne Feinstein).

[119] OLC CVRA Rights Memo, *supra* note 2, at 7–8, 10 (quoting 18 U.S.C. § 3771(a)(1), (5), (8)).

[120] OLC appears to have overlooked another right that could well apply before charges are filed: the right to be notified of one's rights under the CVRA. *See* 18 U.S.C. § 3771(c)(1) (requiring prosecutors to "make their best efforts to see that crime victims are notified of, and accorded, the rights described in [the CVRA]"); United States v. Rubin, 558 F. Supp. 2d 411, 428 (E.D.N.Y. 2008) (discussing potential application of the right to

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For purposes of this Article, it is appropriate to focus on the last two of these three rights: the right to confer and the right to fair treatment. The first of these three rights—the right to be reasonably protected—is already clearly extended by another statute to crime victims before the filing of charges. While OLC does not acknowledge this fact, the VRRA extends the first right to crime victims, directing that a "responsible official shall arrange for a victim to receive reasonable protection from a *suspected* offender and persons acting in concert with or at the behest of the *suspected* offender."[121] Because a "suspected" offender obviously exists before the filing of criminal charges, the VRRA envisions the right to protection being provided as soon as is practical after a victim suffers from the commission of a crime. Additionally, the sections of the *Attorney General Guidelines for Victim and Witness Assistance* addressing the VRRA direct that Justice Department components must provide reasonable protection even before the filing of criminal charges.[122] So, under the VRRA, the Justice Department should already be providing reasonable protection for a victim before an offender is indicted, regardless of how the CVRA is interpreted.[123]

The VRRA, however, does not contain a right to confer and a right to fair treatment and respect for the victim's dignity. Therefore, if victims are going to receive these statutory rights before trial, these rights must be found in the CVRA. With regard to the CVRA provision that victims have the "reasonable right to confer with the attorney for the Government in the case,"[124] OLC contends that "[t]he phrase 'in the case' implies the pendency of a judicial proceeding."[125] To bolster its conclusion, OLC then cites *Black's Law Dictionary*, which includes among its several definitions of the word "case" the definition "a civil or criminal proceeding."[126] But OLC does not acknowledge that *Black's Law Dictionary* also defines and exemplifies a "case" more broadly as a "criminal investigation <the

notification of rights before charges are filed). For purposes of this Article, it is not necessary to explore this right in detail. If other CVRA rights apply before charges are filed, *a fortiori* this right does as well. If a victim has a right, presumably the victim should be notified of the existence of that right.

[121] 42 U.S.C. § 10607(c)(2) (2006) (emphasis added).

[122] *See* ATTORNEY GENERAL GUIDELINES, *supra* note 52, at 7–8, 26–28.

[123] Exactly what "reasonable protection" means, however, remains uncertain. *See generally* Mary Margaret Giannini, *Redeeming an Empty Promise: Procedural Justice, the Crime Victims' Rights Act, and the Victim's Right to Be Reasonably Protected from the Accused*, 78 TENN. L. REV. 47 (2010) (suggesting the right has not been adequately defined and proposing ways to do so).

[124] 18 U.S.C. § 3771(a)(5).

[125] OLC CVRA Rights Memo, *supra* note 2, at 8.

[126] *Id.* (citing BLACK'S LAW DICTIONARY, *supra* note 59, at 243).

Manson case>."[127] Thus, *Black's Law Dictionary* does not help resolve the dispute as to which of the two meanings should be used, as there are clearly differing meanings. While OLC's reading may be a permissible one, so is a pro-victim reading.

OLC also turns to the CVRA's legislative history to bolster its conclusion. But, here again, its analysis is misleading. OLC relies on a passage from Senate floor colloquy between Senators Jon Kyl and Dianne Feinstein regarding the CVRA's scope. In OLC's recounting of the legislative history, the floor statements "emphasize that the right to confer relates to the conduct of criminal proceedings after the filing of charges."[128] For instance, OLC quotes Senator Kyl stating that "[u]nder this provision, victims are able to confer with the Government's attorney about proceedings *after charging*."[129]

This is a truncated and deceptive description of the legislative history, so much so that Senator Kyl sent an angry letter to Attorney General Eric Holder complaining about the distortion. On June 6, 2011, the Senator wrote to "express [his] surprise that [OLC is] so clearly quoting [his] remarks out of context."[130] Senator Kyl then went on to observe that the colloquy began by noting that the right to confer "*is intended to be expansive*."[131] The Senator further discussed various "examples" of when the right to confer applied, including "any critical stage or disposition of the case. *The right, however, is not limited to these examples*."[132] It was against that backdrop that Senator Kyl gave the example of conferring about proceedings "after charging."

In his letter to Attorney General Holder, Senator Kyl also noted that he had:

> made clear that crime victims had rights under the CVRA even before an indictment is filed. For example, . . . I made clear that crime victims had a right to consult about both 'the case' and 'case proceedings'—i.e., both about how the case was being handled before being filed in court and then later how the case was being handled in court 'proceedings.'[133]

Senator Kyl further commented that he had discussed the CVRA's potential application in grand jury proceedings, an application that required the Act

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[127] BLACK'S LAW DICTIONARY, *supra* note 59, at 244.

[128] OLC CVRA Rights Memo, *supra* note 2, at 9.

[129] *Id.* (emphasis added) (quoting 150 CONG. REC. 7302 (2004) (statement of Sen. Jon Kyl) (internal quotation marks and citation omitted).

[130] Letter from Jon Kyl, *supra* note 3.

[131] *Id.* (quoting 150 CONG. REC. S4260, S4268 (daily ed. Apr. 22, 2004) (statement of Sen. Dianne Feinstein)).

[132] *Id.*

[133] *Id.*

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to extend rights before indictment.[134] Thus, if anything, the legislative history does not support OLC's conclusion—it contradicts it.[135]

OLC should have had no doubt as to the intent of Senator Kyl and his cosponsors at the time of the Act's passage. Shortly after shepherding the CVRA through the Congress, Senator Kyl cowrote a law review article about the Act.[136] In that article, he directly indicated that the CVRA applies before charges are filed. Senator Kyl and his coauthors wrote:

> While most of the rights guaranteed by the CVRA apply in the context of legal proceedings following arrest and charging, other important rights are triggered by the harm inflicted by the crime itself. For example, the right to be treated with fairness, the right to be reasonably protected from the accused (who may qualify as the accused before his arrest), and the right to be treated with respect for the victim's dignity and privacy each may arise without regard to the existence of legal proceedings.[137]

Remarkably, OLC cited Senator Kyl's law review article (in a footnote), but then concluded without explanation that the CVRA cosponsor's views were for some reason different than Congress's.[138]

OLC also appears to acknowledge that its interpretation of the CVRA could well contradict what it describes as prosecutorial "good practice."[139] OLC noted that some Justice Department components (for example, the Environmental and Natural Resources Division) had advocated that the right to confer should apply during pre-charging plea discussions.[140] OLC then acknowledged that limiting the right to confer until after formal charging could "reduce the impact of a victim's participation in subsequent court proceedings."[141] OLC attempted to dodge this problem by explaining: "The question before us, though, is not whether it would be advisable as a matter of good practice . . . for Government attorneys to confer with victims pre-charge when appropriate . . . ."[142] OLC then explained that even under its narrow interpretation of the statute, "the CVRA would still ensure that

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[134] *Id.*

[135] Attorney General Holder never sent a response to Senator Kyl's letter. But Assistant Attorney General Ronald Weich sent a belated response. Letter from Ronald Weich, Assistant Att'y Gen., to Jon Kyl, U.S. Sen. (Nov. 3, 2011) (on file with authors). That response did not address Senator Kyl's concern that his remarks were being quoted out of context.

[136] *See generally* Kyl et al., *supra* note 19.

[137] *Id.* at 594.

[138] OLC CVRA Rights Memo, *supra* note 2, at 8 n.7.

[139] *Id.* at 10.

[140] *Id.* at 9 (citations omitted) (discussing an interdepartmental memorandum addressing this question).

[141] *Id.* at 10.

[142] *Id.*

the victim has an opportunity to be heard by the court, and by the Government, before the court accepts the plea."[143]

But OLC failed to recognize that its interpretation of the CVRA rendered the right to be heard a nullity in many important cases—including, notably, the Epstein case.[144] Where prosecutors and defense attorneys work out a nonprosecution agreement that agreement will never be presented to a court for review. Thus, in cases where the need for victim participation may be the greatest—that is, in cases where the Government is considering never filing any charges—OLC's interpretation would bar victims from having any rights at all.

Even in situations where a prosecutor works out a plea agreement, OLC's interpretation is problematic. As OLC recognizes, prosecutors and defense counsel commonly work out pre-indictment plea agreements (particularly in white-collar cases), under which a defendant will plead guilty to certain charges.[145] Then, the parties jointly present to the district court a criminal "information" (that is, a recitation of the charges drafted by the prosecutor but never presented to the grand jury[146]) and a plea agreement, asking the court to file the criminal information and simultaneously accept the guilty plea. As the OLC memorandum acknowledges, a crime victim would have the right to object to the plea agreement, because the CVRA gives crime victims the "right to be reasonably heard" at any public proceedings involving a plea.[147] But under OLC's interpretation of the CVRA, a crime victim has no right to notice of court hearings until the charges are filed. Thus, if the information and plea are filed simultaneously, as is often the case, two scenarios are possible. A victim could have no prior right to notice of the proceeding at which the plea was being accepted, or alternatively (if the act of filing the information in the course of accepting a plea triggers a notification right), the district court would be required to stop in the middle of proceedings and ensure that notification was belatedly provided. Of course, these difficulties are all avoided if the right to confer is properly construed as attaching before charges are filed, such as during plea negotiations between prosecutors and defense attorneys.

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[143] *Id.*

[144] The OLC opinion was publicly released on May 20, 2011. Perhaps not coincidentally, this release date was shortly before the Government filed its response in the Epstein case.

[145] *See* OLC CVRA Rights Memo, *supra* note 2, at 9 (acknowledging the potential effect of the CVRA on plea negotiations).

[146] *See* FED. R. CRIM. P. 7(b).

[147] 18 U.S.C. § 3771(a)(4) (2012); OLC CVRA Rights Memo, *supra* note 2, at 6–7.

More importantly, extending the right in this fashion will not be unduly burdensome for federal prosecutors. After the OLC memorandum was made public, the Department amended the *Attorney General Guidelines for Victim and Witness Assistance* to require prosecutors to make reasonable efforts toward a goal of providing victims with a meaningful opportunity to offer their views before plea agreements are formally reached.[148] "In circumstances where plea negotiations occur before a case has been brought, Department policy is that this should include reasonable consultation prior to the filing of a charging instrument with the court."[149] Thus, Department policy already extends pre-charging rights to victims. The CVRA should be understood as having the same scope.

OLC also notes that the CVRA right "to be treated with fairness and with respect for the victim's dignity and privacy" is a right that could apply before charges are filed.[150] Indeed, OLC is forced to concede (as district courts have recognized) that the "right to be treated with fairness and with respect for the victim's dignity and privacy may apply with great force during an investigation, before any charging instrument has been filed."[151]

OLC nonetheless maintains that the right to fairness only applies after charges have been filed. OLC relies on the canon of statutory construction *noscitur a sociis*, meaning that words are known by their companions,[152] for its interpretation of the CVRA. OLC argues that because the other seven enumerated rights are limited to post-charging situations, the eighth right should be as well. Of course, this argument assumes that OLC's construction of the other seven rights is correct—a point very much in dispute.[153] If, for example, the right to confer applies before charges are filed, then presumably *noscitur a sociis* would cut the other way—the right to fairness should likewise be construed as applying before charges are filed.

Moreover, OLC omits from its discussion of the fairness provision any assessment of the CVRA's purposes. In construing a statute, a court must consider the "purpose and context" of the statute.[154] In describing the fairness provision, Senator Kyl emphasized that it conferred a "broad"

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[148] ATTORNEY GENERAL GUIDELINES, *supra* note 52, at 41–42.

[149] *Id.* at 41.

[150] OLC CVRA Rights Memo, *supra* note 2, at 10 (quoting 18 U.S.C. § 3771(a)(8)).

[151] *Id.* (quoting United States v. BP Products North America Inc., No. H-07-434, 2008 WL 501321, at *11 (S.D. Tex. Feb. 21, 2008) (internal quotation marks omitted)).

[152] *Id.* at 11.

[153] *See supra* Part III.A.

[154] Kasten v. Saint-Gobain Performance Plastics Corp., 131 S. Ct. 1325, 1331 (2011).

right.[155] The reason for adopting such a broad right was that "[t]oo often victims of crime experience a secondary victimization at the hands of the criminal justice system. This provision is intended to direct Government agencies and employees, whether they are in the executive or judiciary branch, to treat victims of crime with the respect they deserve."[156] OLC's failure to consider the purposes underlying the CVRA is a glaring oversight.

OLC never attempts to explain why the CVRA's drafters would want victims to have a right to fair treatment once criminal charges were filed but possess no such right before the filing of criminal charges. Clearly, many victims can and do suffer secondary victimization during criminal investigations, such as when sexual assault victims are treated inappropriately by law enforcement agents.[157] It would contradict the purpose of preventing victim mistreatment in the criminal justice system to artificially limit the right to fairness to the point at which charges are filed. The right to fairness logically applies at all stages of the criminal justice process.

C. OLC'S INEFFECTIVE RESPONSE TO THE CVRA'S COVERAGE AND VENUE PROVISIONS

At the end of its memorandum, OLC finally discusses what it identifies as the two strongest arguments for construing the CVRA as applying before charging: the coverage provision and the venue provision. OLC acknowledges, as it must, that the CVRA's coverage extends to any federal employee engaged in "the *detection*, *investigation* or prosecution of crime."[158] Such employees "shall make their best efforts to see that crime victims are notified of, and accorded, the rights" afforded by the statute.[159] Notably, this duty applies to individuals not just in the Justice Department (where all federal prosecutors are located) but other agencies as well, such

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[155] 150 CONG. REC. 7303 (2004) (statement of Sen. Jon Kyl).

[156] *Id.*

[157] *See* SUSAN ESTRICH, REAL RAPE 50–51 (1987) (describing how a rape victim's sexual history may be used against her in court proceedings); Beloof, *supra* note 38, at 309–10 (collecting examples of victims' issues that arise during the investigative process); *see also* PRESIDENT'S TASK FORCE ON VICTIMS OF CRIME, FINAL REPORT, *supra* note 10, at 57–62 (making recommendations for how police should treat victims during the criminal justice process).

[158] OLC CVRA Rights Memo, *supra* note 2, at 15 (quoting 18 U.S.C. § 3771(c)(1) (2012)) (internal quotation marks omitted).

[159] 18 U.S.C. § 3771(c)(1).

as environmental crimes investigators in the Environmental Protection Agency (EPA).[160]

This coverage provision would seem to answer any lingering question about whether the CVRA applies before charging. In directing that federal employees engaged in the "detection" and "investigation" of crime must respect victims' rights, Congress wanted broad rights extending beyond just the prosecution of a case. As the district court concluded in the Epstein case, this provision "surely contemplates pre-charge application of the CVRA."[161]

OLC gamely maintains, however, that Congress was simply trying to provide that federal law enforcement agents should provide rights to victims when a criminal case moves to its prosecution phase. OLC noted the uncontroversial point that law enforcement agents "often develop a relationship of trust with crime victims during the investigation that continues as they assist crime victims in negotiating active criminal proceedings."[162] OLC then asserted:

> Given this continuing active role that agents typically play during criminal prosecutions, we find the fact that the CVRA assigns responsibility to them, together with the attorney for the Government, to . . . accord them their rights under the CVRA to be entirely consistent with our conclusion that those rights arise only once the Government has initiated criminal proceedings.[163]

But OLC's contorted position never explains why Congress found it necessary to break out three separate phases of the criminal justice process: the "detection," "investigation," and "prosecution" of crime. If the congressional intent was simply to cover, for example, FBI agents or EPA agents during the post-charging phase of a case, it could have simply omitted those words from the CVRA. An FBI agent, for example, would be engaged in the "prosecution" of the case when assisting the victim after the formal filing of charges. On OLC's reading of the statute, the words "detection" and "investigation" become meaningless, contrary to the well-known canon of construction *verba cum effectu sunt accipienda*, which means that, if possible, every word and every provision is to be given effect.[164]

OLC also suggests that the "most significant" argument supporting pre-charging application of rights is the venue provision, which allows

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[160] *See* Kyl et al., *supra* note 136, at 615 ("Notice should be given to the fact that it applies not just to the Department of Justice, but to all 'departments and agencies of the United States engaged in the detection, investigation, or prosecution of crime.'" (citation omitted)).

[161] Does v. United States, 817 F. Supp. 2d 1337, 1342 (S.D. Fla. 2011).

[162] OLC CVRA Rights Memo, *supra* note 2, at 15.

[163] *Id*.

[164] *See, e.g.*, Reiter v. Sonotone Corp., 442 U.S. 330, 339 (1979).

crime victims to assert CVRA rights "in the district court in which a defendant is being prosecuted for the crime or, *if no prosecution is underway*, in the district court in the district in which the crime occurred."[165] The Department contends that this language refers quite narrowly to the "period of time between the filing of a complaint and the initiation of formal charges."[166] In support of its position, the Department cites a Fourth Circuit case interpreting the Sixth Amendment right to counsel, which held that a "prosecution" for purposes of that Amendment does not begin when a criminal complaint is filed.[167] In OLC's view, the venue provision's direction that victims should assert rights when "no prosecution is underway" applies only to the limited time between when the Government files a complaint against a defendant and some later point when the "prosecution" actually begins. OLC notes that the filing of a complaint triggers an initial appearance, where crime victims can have important interests at stake, such as the right to be heard about a defendant's release on bail. OLC believes it is only to such post-complaint, yet pre-indictment, proceedings (i.e., the initial appearance) that the venue provision's "no-prosecution-underway" language covers.

As a preliminary matter, OLC's interpretation of the word "prosecution" in the Department's narrow construction of the venue provision is a twisted one, at odds with the way that term is conventionally used. The filing of a complaint is typically viewed as the start of a criminal prosecution. For example, the leading criminal procedure hornbook states that "[w]ith the filing of the complaint, the arrestee officially becomes a 'defendant' *in a criminal prosecution*."[168]

Moreover, having specifically rejected the filing of the criminal complaint as the starting point for a "prosecution" within the CVRA's venue provision, OLC refuses to consider the implications of its alterative starting point: the formal filing of an indictment. OLC states that "a prosecution of a felony must commence with the return of an indictment by a grand jury," citing the *Federal Rules of Criminal Procedure*.[169] Yet OLC does not pause to recognize that, while felonies proceed by way of indictment, misdemeanors can proceed not only by indictment but also by complaint.[170] The CVRA draws no distinction between misdemeanor and

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[165] OLC CVRA Rights Memo, *supra* note 2, at 14 (quoting 18 U.S.C. § 3771(d)(3) (2012)).

[166] *Id.*

[167] *Id.* (citing United States v. Alvarado, 440 F.3d 191, 200 (4th Cir. 2006)).

[168] WAYNE R. LAFAVE ET AL., CRIMINAL PROCEDURE § 1.2(g), at 11 (5th ed. 2009) (emphasis added).

[169] OLC CVRA Rights Memo, *supra* note 2, at 14 (citing FED. R. CRIM. P. 7(a)(1)).

[170] FED. R. CRIM. P. 58(b)(1) ("The trial of a misdemeanor may proceed on an indictment, information, *or complaint*." (emphasis added)).

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felony offenses, broadly extending its protections to victims of any federal offense.[171] Thus, under OLC's interpretation that the filing of a complaint does not trigger the CVRA, many victims who are entitled to CVRA protections—i.e., victims of misdemeanor offenses prosecuted by way of complaint—will never have proper venue to assert those rights because, according to OLC's strained argument, no prosecution ever started in their cases.

Even limiting the focus to felony cases, OLC misleadingly describes the Sixth Amendment case law. It is not immediately clear why one would look to the right to counsel to determine the breadth of the term "prosecution" in the Sixth Amendment. The right to counsel is not the only right found in that Amendment. The Amendment also extends, for example, a right to a speedy trial in all criminal "prosecutions."[172] The case law on the speedy trial right makes clear that the right "may attach before an indictment and as early as the time of arrest and holding to answer a criminal charge."[173]

In any event, the right to counsel cases are quite clear in providing that a Sixth Amendment "prosecution" can (and often does) begin well before an indictment.[174] The Supreme Court has directly held that the Sixth Amendment's right to counsel attaches "at or after the time that judicial proceedings have been initiated against [a person]—'whether by way of formal charge, preliminary hearing, indictment, information, or arraignment.'"[175] Thus, under this controlling precedent, some earlier point in time before indictment is the triggering point of a Sixth Amendment "prosecution."

The cases that OLC cites are not to the contrary. It is true that some federal appeals courts have stated that the mere filing of a criminal complaint does not trigger a Sixth Amendment right to counsel.[176] But there is a split of authority on this question, as OLC acknowledges in a footnote.[177] More importantly for purposes of this Article, the cases holding

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[171] *See* 18 U.S.C. § 3771(e) (2012).

[172] U.S. CONST. amend. VI.

[173] United States v. Gouveia, 467 U.S. 180, 190 (1984) (quoting United States v. MacDonald, 456 U.S. 1, 6–7 (1982)) (internal quotation marks omitted).

[174] *See, e.g.*, Texas v. Cobb, 532 U.S. 162, 172–73 (2001).

[175] Brewer v. Williams, 430 U.S. 387, 398 (1977) (quoting Kirby v. Illinois, 406 U.S. 682, 689 (1972)).

[176] *See, e.g.*, United States v. Alvarado, 440 F.3d 191, 196 (4th Cir. 2006).

[177] OLC CVRA Rights Memo, *supra* note 2, at 14 n.15 (citing Hanrahan v. United States, 348 F.2d 363, 366 n.6 (D.C. Cir. 1965)); *see* WAYNE R. LAFAVE ET AL., CRIMINAL PROCEDURE § 6.4(e), at 670 (3d ed. 2007) ("There is an apparent split of authority on the question of whether the filing of a complaint is alone enough to give rise to a Sixth Amendment right to counsel, though the difference probably is explainable by the fact that

that the mere filing of a complaint does not start a Sixth Amendment prosecution also make clear that a later court hearing would start such a prosecution. For instance, in the Fourth Circuit case cited by OLC, *United States v. Alvarado*, the court reasons that "the main reason a law enforcement officer files [] a complaint is to establish probable cause for an arrest warrant. The criminal process is still in the investigative stage, and the adverse positions of government and defendant have yet to solidify."[178] Relying on that reasoning, the Fourth Circuit refused to find that the right to counsel had attached merely because a police officer had filed a complaint to get an arrest warrant. But the Fourth Circuit distinguished that situation from "the initiation of adversary judicial proceedings against the defendant."[179] An initial appearance would be such an adversary proceeding—i.e., it would be a "prosecution" under the Sixth Amendment. In light of this, OLC's position that the CVRA's venue provision's "no-prosecution-underway" reference covers proceedings, such as an initial appearance, does not work.

The only sensible way to construe the CVRA's venue provision is to read it as conveniently dividing criminal cases into two phases: a prosecution phase and an earlier investigative phase when "no prosecution is under way."[180] Senator Kyl, for instance, has noted that if there are any doubts about how to construe the CVRA, this venue provision "sweeps them away."[181] Once again, the language that Congress used leads inexorably to the conclusion that the CVRA extends rights to victims before the filing of criminal charges.

IV. WHEN PRE-CHARGING RIGHTS ATTACH UNDER THE CVRA

The zeal with which OLC argues against applying CVRA rights before charging raises the question of why it protests so much. Although OLC never articulated this concern, perhaps OLC worried that pre-charging rights would be difficult to administer. Such concerns should evaporate with a workable construction of when pre-charging rights attach. In this Part, we propose such a construction, suggesting that CVRA rights should attach when substantial evidence exists that a specific person has been directly and proximately harmed as the result of a federal crime. This approach appears to already be the method that the Department is taking, as

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this document is used for multiple purposes."); *see also* Felder v. McCotter, 765 F.2d 1245, 1248 (5th Cir. 1985) (citing Texas law).

[178] *Alvarado*, 440 F.3d at 200 (citations omitted) (internal quotation marks omitted).

[179] *Id.* (quoting United States v. Gouveia, 467 U.S. 180, 187 (1984)).

[180] 18 U.S.C. § 3771(d)(3) (2012).

[181] Kyl et al., *supra* note 19, at 594.

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it has extended many rights to victims before the formal filing of criminal charges as a matter of internal policy.[182] This approach appears to be workable, as a number of states extend rights to victims during the investigative process.[183]

A. A TEST FOR DETERMINING WHEN RIGHTS ATTACH

As explained in the earlier Parts of this Article, the CVRA clearly envisions that crime victims would have rights in the criminal justice process before the return of indictments or the filing of criminal complaints. The question then as to how much earlier in the process crime victims have rights naturally arises. Does the CVRA apply one second after a federal crime has been committed? Or does it apply at some later point during an investigation?

This issue was nicely framed by the U.S. District Court for the Eastern District of New York in a securities fraud case. In the first indictment underlying the case, the charged crime did not include various victims. A later superseding indictment broadened the charges to include those missing individuals. When they brought a suit under the CVRA, the court noted that "[q]uite understandably, movants perceive their victimization as having begun long before the government got around to filing the superseding indictment."[184] The court, however, explained that there must be "logical limits" to crime victims' rights before the filing of charges.[185] The court noted:

> For example, the realm of cases in which the CVRA might apply despite no prosecution being 'underway,' cannot be read to include the victims of uncharged crimes that the government has not even contemplated. It is impossible to expect the government, much less a court, to notify crime victims of their rights if the government has not verified to at least an elementary degree that a crime has actually taken place, given that a corresponding investigation is at a nascent or theoretical stage.[186]

The logical limits that the CVRA envisions could come from how the Justice Department interacts with criminals during the investigation of a crime. Crime victims' rights advocates are fond of saying that victims "only want to be treated like criminals"—that is, they simply want to have the same kinds of rights as criminals receive, such as the right to be notified

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[182] *See, e.g.*, ATTORNEY GENERAL GUIDELINES, *supra* note 52, at 41–42 (discussing the right to confer regarding plea bargains).

[183] *See infra* Part III.D.

[184] United States v. Rubin, 558 F. Supp. 2d 411, 419 (E.D.N.Y. 2008).

[185] *Id.*

[186] *Id.*

of court hearings and to attend those hearings.[187] So it is instructive to notice that the Justice Department policy is to extend certain rights to suspected criminals during certain points in the investigative process. That policy might provide guidance on when crime victims' rights would attach.

Of particular interest here is the Department's policy for grand jury subpoenas issued to a "target" of a criminal investigation. When such a target is subpoenaed to testify before a grand jury, the Department of Justice will advise that target of his rights, such as the right to refuse to answer any question that might be incriminating.[188] The Department of Justice defines a "target" of a criminal investigation as "a person as to whom the prosecutor or the grand jury has substantial evidence linking him or her to the commission of a crime and who, in the judgment of the prosecutor, is a putative defendant."[189]

If the Department's investigation has coalesced sufficiently so that it can provide notice of rights to putative defendants, it should likewise be in a position to provide notice of rights to that defendant's victims. Combining the Department's definition of "target" with the CVRA's coverage and definition-of-victim provisions produces a formulation whereby CVRA rights attach in (at least) the following circumstances:

CVRA rights attach when an officer or employee of the Department of Justice or any other department or agency of the United States engaged in the detection, investigation, or prosecution of crime has substantial evidence that an identifiable person has been directly and proximately harmed as a result of the commission of a federal offense or an offense in the District of Columbia, and in the judgment of the officer or employee, that person is a putative victim of that offense.

This formulation borrows from the CVRA's coverage provision[190] to define the relevant universe of substantial evidence as that in the possession of the Justice Department or other federal agencies. For instance, if state law enforcement officers are investigating a bank robbery, the fact that the robbery might also be prosecuted federally[191] does not make the teller at the bank a federal "victim" of the crime until evidence regarding the crime comes into the possession of a federal agency. The formulation also tracks the CVRA's definition of "victim" in limiting the universe of potential

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[187] *See, e.g.*, Cassell, *supra* note 15, at 1376–85 (describing the rationale underpinning state victims' rights statutes).

[188] CRIMINAL RESOURCE MANUAL, *supra* note 87, § 9-11.151.

[189] *Id.*

[190] 18 U.S.C. § 3771(e) (2012).

[191] *Id.* § 2113.

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victims to those who have been "directly and proximately harmed."[192] Finally, the formulation requires some federal officer or employee to evaluate the evidence and reach the conclusion that a federal offense has been committed that harmed the person in question. This determination responds to the observation by the District Court for the Eastern District of New York that the CVRA "cannot be read to include the victims of uncharged crimes that the government has not even contemplated."[193] At the same time, such a formulation obviously does not require the filing of formal criminal charges, or even the preparation of formal criminal charges. Instead, all that is required is for the Department to recognize that a person is a putative victim of a federal offense, just as all that is required for the mailing of a target letter to a subpoenaed suspected criminal, is recognition that he is a putative defendant in a federal case.

B. APPLYING THE TEST TO THE EPSTEIN CASE

To illustrate how the test would operate, it is useful to examine the facts of the Epstein case. Applying the proposed test to that case produces straightforward answers, which suggests that the test would be workable in practice.

From 2001 to 2007, Jeffrey Epstein sexually abused more than thirty minor girls in his mansion, including Jane Doe Number One and Jane Doe Number Two.[194] Initially, of course, his acts of abuse were secret, unknown to law enforcement. During that period of time, the victims would not have had rights under the CVRA.

In 2006, Epstein's acts of abuse came to the attention of the Palm Beach Police Department, which began investigating the case.[195] At this point, once again, the victims would not have had rights under the proposed CVRA test. The CVRA extends rights in the federal criminal justice process. A state investigation does not trigger the CVRA (although it may trigger certain state law protections, as discussed below).[196]

At some point in 2006, the Palm Beach Police Department asked the FBI to investigate Epstein on federal sex offenses, such as using a means of

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[192] *See id.* § 3771(e).

[193] United States v. Rubin, 558 F. Supp. 2d 411, 419 (E.D.N.Y. 2008).

[194] As above, *see supra* notes 34–41 and accompanying text, this part of the Article draws on the factual allegations made by the victims in this case—allegations that Epstein has not intervened to dispute. *See* Jane Doe Motion, *supra* note 40, at 3–23.

[195] *See* Probable Cause Affidavit, Palm Beach Police Department: Police Case No. 05-368(1) (May 1, 2006), *available at* http://goo.gl/fAPFw5; *see also* Statement of Undisputed Facts, Epstein v. Rothstein, No. 50 2009 CA 040800XXXXMBAG (Fla. Cir. Ct. Sept. 22, 2010), *available at* http://goo.gl/DzMbe8.

[196] *See supra* notes 178–95 and accompanying text as well as *infra* Part IV.D.

interstate communication in connection with sex offenses and traveling in interstate commerce for the purpose of engaging in illicit sexual conduct with minors.[197] The local police provided the FBI with information, which the FBI then investigated. Following an investigation, the FBI determined that the allegations of abuse against Epstein were credible, and it presented the case to the U.S. Attorney's Office for the Southern District of Florida. In 2007, the Office contacted counsel for Jeffrey Epstein and began negotiating a resolution of the case against him.[198]

Under our proposed test, the victims would not have had CVRA rights the first moment that the FBI became aware of Epstein's possible commission of sex offenses. But after the FBI developed substantial evidence of those sex offenses, identified victims of those offenses, and presented the case to the appropriate U.S. Attorney's Office for prosecution, CVRA rights would have attached. Accordingly, the FBI would have been required to notify the identified victims of their rights under the CVRA (as well as under the VRRA). From that point forward in the case, the victims would have had CVRA rights, such as the right to fair treatment and the right to confer with prosecutors. In this case, the victims would have had the right to confer with prosecutors about the nonprosecution agreement that they ultimately reached with Epstein.[199]

C. CURRENT DEPARTMENT POLICY ON PRE-CHARGING RIGHTS

One objection that might be made to the formulation offered above is that it might unduly burden federal law enforcement officers and prosecutors, who would need to make judgment calls about when an investigation has coalesced to the point where "victims" are in existence, "substantial evidence" has been collected, and notice of rights has to be provided. Any such objection would be ill-founded, though, as it does not appear that implementing such an approach would be difficult.[200] Presumably the Justice Department has already been providing such rights in at least Texas, Louisiana, and Mississippi to comply with the Fifth

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[197] *See* 18 U.S.C. §§ 2422(b), 2423(b), (e) (2012).

[198] A more substantial summary of the case is available in case filings. *See* Jane Doe Motion, *supra* note 40.

[199] *See supra* Part II.

[200] This Article does not discuss mass victim cases in which notice needs to be provided to hundreds of victims. But in such situations, the CVRA already provides for "reasonable" alternative procedures. 18 U.S.C. § 3771(d)(2) (2012). The Department of Justice, for example, has used websites to provide notice in terrorism cases to large numbers of victims. *See, e.g.*, United States v. Ingrassia, No. CR-04-0455ADSJO, 2005 WL 2875220, at *4 (E.D.N.Y. Sept. 7, 2005); *Criminal Division's Victim Notification Program*, U.S. DEP'T OF JUSTICE, http://goo.gl/6H6IEk (last visited Dec. 4, 2013).

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Circuit's 2008 ruling in *In Re Dean*, which held that the CVRA extends rights to victims before defendants are charged.[201] We have not seen any reports that providing the rights has been difficult.

Perhaps the reason for the lack of any reported difficulty is that the Department's current policy on crime victims' rights already requires notices to victims during investigations. The Justice Department has promulgated the *Attorney General Guidelines for Victim and Witness Assistance*, the latest edition of which is from May 2012. The *Guidelines* discuss crime victims' rights under both the CVRA and the earlier VRRA. Because of the OLC memorandum discussed above, the *Guidelines* limit CVRA rights until after the time "when criminal proceedings are initiated by complaint, information, or indictment."[202] The Department, however, provides hortatory guidance that Justice Department employees shall make "best efforts" to notify crime victims about their CVRA rights "as early in the criminal justice process as is feasible and appropriate."[203]

Of greater interest, however, is the Department's mandatory policy regarding notification regarding crime victim services under the VRRA. The *Guidelines* explain how "Department responsibilities to crime victims begin as soon as possible after the detection of a crime at which they may be undertaken without interfering in the investigation."[204] The *Guidelines* then direct the appropriate "responsible official" to provide crime victims with "information about services available to them."[205] This information must be provided at "the earliest opportunity after detection of a crime at which it may be done without interfering with an investigation."[206]

The Department appears to have little difficulty implementing this requirement. Evidence of this fact comes from the Justice Department itself, which responded to the letter from Senator Kyl discussed earlier questioning why the Department was not applying the CVRA before charges were filed.[207] In its response, the Department noted that OLC had issued an opinion that the CVRA did not extend rights before the formal filing of charges.[208] "Even so," the Department explained, "the new AG Guidelines go further and provide that Department prosecutors should make

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[201] 527 F.3d 391 (5th Cir. 2008).

[202] ATTORNEY GENERAL GUIDELINES, *supra* note 52, at 8.

[203] *Id.* at 35.

[204] *Id.* at 26 (citing 42 U.S.C. § 10607(b) (2006)).

[205] *Id.* at 29 (citing 42 U.S.C. § 10607(b)(2)). Elsewhere, the *Guidelines* define the official who is responsible as the appropriate federal law enforcement officer during the investigation of the crime or the U.S. Attorney once charges have been filed. *Id.* at 25–26.

[206] *Id.* at 29.

[207] *See supra* notes 130–33 and accompanying text.

[208] Letter from Ronald Weich, *supra* note 135, at 2.

reasonable efforts to notify identified victims of, and consider victims' views about, prospective plea negotiations, even prior to the filing of a charging instrument with the court."[209]

The Department also noted that it provided extensive pre-charging notifications to victims under the VRRA:

> Pursuant to the Victims' Rights and Restitution Act of 1990 (VRRA), the Department identifies victims and provides to them service referrals, reasonable protection, notice concerning the status of the investigation, and information about the criminal justice process prior to the filing of any charges. The Department's investigative agencies provide such services to thousands of victims every year, whether or not the investigation results in a federal prosecution.[210]

Quantifying the scope of this undertaking with regard to one federal investigative agency, the Department explained:

> [T]he [FBI] alone reports that it provided more than 190,000 services to victims during the past fiscal year [FY 2011], including case status updates, assistance with compensation applications and referrals, and counseling referrals. From sexual assaults in Indian Country to child pornography and human trafficking to mass violence and overseas terrorism, FBI victim specialists provide much-needed immediate and ongoing support and information to victims. The FBI addresses victim safety issues when needed, providing on-scene response and crisis intervention services in thousands of investigations. With regard to sexual assault victims, FBI personnel arrange for and often accompany victims to forensic sexual assault medical examinations and provide assistance with HIV/STD testing.[211]

In view of the Department's existing notifications and provision of services before charges are filed under the VRRA, it is hard to conceive how any viable claim could be made that it would be difficult to provide similar rights under the CVRA. The four rights that would be potentially in play before charging would be the right to reasonable protection, the right to fair treatment, and the right to confer with prosecutors, along with the predicate right to notice of these rights.[212] The VRRA already requires the Department to provide reasonable protection, so this would not be an expanded obligation.[213] Similarly, the *Guidelines* already require prosecutors to confer with victims about plea agreements (the most common situation where victims want to confer), so it is hard to imagine how extending this right would create any undue burden.[214] Additionally, the right to "fair treatment" could only be a problem if the Department

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[209] *Id.*
[210] *Id.* at 2–3.
[211] *Id.* at 3.
[212] 18 U.S.C. § 3771(a)(1), (5), (8), (c)(1) (2012).
[213] *See* 42 U.S.C. § 10607(c)(2) (2006).
[214] *See* ATTORNEY GENERAL GUIDELINES, *supra* note 52, at 41–42.

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wanted to treat victims unfairly. Given its repeated and professed commitment to crime victims, here too this obligation should not be burdensome. And finally, with regard to providing notice of CVRA rights to victims, the fact that the Department currently provides notice of VRRA rights indicates that it should not be difficult to provide notice of CVRA rights as well.

Indeed, it is possible that the Department's notification letters under the VRRA already include this information. Interestingly, in the Epstein case, the FBI notified Jane Doe Number One and Jane Doe Number Two that they had rights in the criminal justice process. As early as June 7, 2007—more than three months before it concluded a nonprosecution agreement with Epstein—the U.S. Attorney's Office sent a notice to Jane Doe Number One stating "your case is under investigation."[215] The notice also informed Jane Doe Number One that "as a victim and/or witness of a federal offense, you have a number of rights."[216] Among the rights that the U.S. Attorney's Office told Jane Doe that she possessed was "[t]he reasonable right to confer with the attorney for the United States in the case."[217] Of course, she would not have had those rights if she was not covered by the CVRA. The FBI therefore apparently assumed that the CVRA already applied in the Epstein case. It was only later, when the matter went into litigation, that the Department of Justice reversed course. This change in course underscores the problems arising out of the OLC memorandum and the Department's current interpretation of the CVRA.

D. STATE LAW EXTENSION OF PRE-CHARGING RIGHTS

The focus of this Article so far has been crime victims' rights in the federal system. But in concluding, it is instructive to note how a number of states offer parallel rights for crime victims, including the right to confer with prosecutors. In fact, several states have extended such rights prior to formally filing of charges against defendants—without reported difficulty, so far as we are aware. This confirms our inference that extending CVRA rights to crime victims before the formal filing of criminal charges is both feasible and desirable.

A general overview of state laws illustrates the broad protections afforded to victims in state criminal justice systems. Nearly two-thirds of states have adopted constitutional provisions to protect victims throughout

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[215] Letter from A. Marie Villafaña, Assistant U.S. Att'y, to Jane Doe #1 (June 7, 2007), *reprinted in* Jane Doe Motion, *supra* note 40, at ex. C.

[216] *Id.*

[217] *Id.*

the criminal justice process.[218] Moreover, every state has adopted a statute that either enforces its constitutional amendment or creates independent statutory rights for crime victims.[219] As a result, state legislatures and state employees have attempted to give victims a voice in the criminal justice process across the country.

Notably, while the strength of these rights varies from state to state,[220] nearly forty states require the prosecuting attorney to notify or confer with the victim regarding plea negotiations.[221] Several jurisdictions involve the victim in the charging decision.[222] In some states, law enforcement and prosecutors must involve the victim at any "critical"[223] or "crucial"[224] stage of the criminal proceeding; and in a minority of jurisdictions, the judge must ascertain whether the prosecutor has afforded the victim statutory protections prior to accepting a plea agreement.[225]

The general contours of state provisions suggest that several state governments have recognized the value in informing victims of their rights and involving them in the criminal process prior to the formal filing of charges.[226] Indeed, a brief look at the statutory protections illustrates the extent to which states have attempted to afford protections to victims long before the formal filing of charges.

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[218] *See Victims' Rights Laws by State*, NAT'L CRIME VICTIM L. INST. (Oct. 17, 2013), http://goo.gl/pdDx1w (listing and linking to state laws and constitutional amendments).

[219] *See* LAFAVE ET AL., *supra* note 168, § 21.3(f), at 1041–42.

[220] *See generally* DEAN G. KILPATRICK ET AL., NAT'L INST. OF JUSTICE, U.S. DEP'T OF JUSTICE, THE RIGHTS OF CRIME VICTIMS—DOES LEGAL PROTECTION MAKE A DIFFERENCE? (1998), *available at* http://goo.gl/EzH61S.

[221] *See* Peggy M. Tobolowsky, *Victim Participation in the Criminal Justice Process: Fifteen Years After the President's Task Force on Victims of Crime*, 25 NEW ENG. J. ON CRIM. & CIV. CONFINEMENT 21, 64 & n.168 (1999) (citing to victims' rights statutes in Connecticut, Illinois, and Michigan, among others). Unfortunately, as some commentators have noted, the notice and conferral provisions in some states are ambiguous, and the absence of case law precludes a definitive understanding of the reach of the right in some jurisdictions. *See* LAFAVE ET AL., *supra* note 168, § 21.3(f), at 1041–42; *see also, e.g.*, KAN. STAT. ANN. § 74-7333(a)(5) (2002) ("The views and concerns of victims should be ascertained and the appropriate assistance provided throughout the criminal process."). In some jurisdictions, the ambiguous use of an illustrative list could be read as suggesting that a particular right, such as conferral, hinges on formal charges. *See, e.g.*, KY. REV. STAT. ANN. § 421.500(6) (LexisNexis Supp. 2012) (requiring consultation on "disposition of the case including dismissal, release of defendant pending judicial proceedings, any conditions of release, a negotiated plea, and entry into a pretrial diversion program," but failing to define "disposition" or "case").

[222] *See* Tobolowsky, *supra* note 221, at 59–60.

[223] *E.g.*, LA. REV. STAT. ANN. §§ 46:1842(2), 46:1844(K) (2010).

[224] *E.g.*, FLA. CONST. art. I, § 16(b) (refraining from identifying the term).

[225] *See* LAFAVE ET AL., *supra* note 168, § 21.3(f), at 1041.

[226] *See Victims' Rights Laws by State*, *supra* note 218.

For example, Arizona has adopted a constitutional amendment and statutes that expansively protect victims. Under Arizona law, the definition of victim hinges on whether a criminal offense has been committed, and the term "criminal offense" is defined as "conduct that gives a peace officer *or* prosecutor probable cause to believe" a crime has occurred.[227] In short, a victim's status does not hinge on the formal filing of charges but rather on the criminal conduct itself.[228] Arizona law enforcement personnel must give information to victims describing their rights as soon as possible, even if formal charges have not yet been filed, and a victim may request that the prosecutor discuss the disposition of the case, including "a decision not to proceed with a criminal prosecution, dismissal, plea, or sentence negotiations and pretrial diversion programs."[229] A victim may even pursue some rights if counts are dismissed.[230] Arizona courts have also permitted victims to invoke their rights in the context of civil forfeiture proceedings.[231]

Hawaii's victims' rights statute illustrates how a state has defined the term "case" more expansively than the limited definition advocated by the Department in order to facilitate victim participation. By statute in Hawaii, victims must, upon request, be informed of "major developments" in any felony case.[232] Along a similar vein, the prosecuting attorney must consult or advise the victim about any plea negotiations.[233] Interestingly, however, the Hawaii legislature defined "major developments" as "arrest or release of the suspect by the police, case deferral by the police, referral to the prosecutor by the police, rejection of the case by the prosecutor, preliminary hearing date, grand jury date, trial and sentencing dates, and the disposition of the case."[234] The usage of the term "case" and the plain language of the provisions demonstrate that victims in the State of Hawaii are entitled to a notification right and a possible consultation right long before formal charges are filed.

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[227] ARIZ. REV. STAT. ANN. § 13-4401(6) (2010) (emphasis added); *see* State *ex rel.* Thomas v. Klein, 150 P.3d 778, 780–81 (Ariz. Ct. App. 2007) (noting the original version defined a criminal offense as a violation of a statute).

[228] Under Arizona law, the "rights and duties that are established by this chapter arise on the arrest *or* formal charging of the person or persons who are alleged to be responsible for a criminal offence against a victim." ARIZ. REV. STAT. ANN. § 13-4402(A) (2010) (emphasis added).

[229] ARIZ. REV. STAT. ANN. § 13-4419(A) (2010).

[230] *See* ARIZ. REV. STAT. ANN. § 13-4402.01(A).

[231] It appears, however, that the criminal proceeding may have been parallel to the civil forfeiture proceeding. *See* State v. Lee, 245 P.3d 919, 923–24 (Ariz. Ct. App. 2011).

[232] HAW. REV. STAT. ANN. § 801D-4(a)(1) (LexisNexis 2007).

[233] *See id.*

[234] *Id.* § 801D-2.

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Other states also expressly extend rights before the filing of charges. Colorado guarantees rights at "all critical stages of the criminal justice process[,]" which includes both the filing of charges and the decision to not file charges.[235] In Missouri, victims have the right:

> on charged cases or submitted cases where no charge decision has yet been made, to be informed by the prosecuting attorney of the status of the case and of the availability [of different forms of compensation and assistance] and of any final decision by the prosecuting attorney not to file charges.[236]

In New Jersey, officials typically send a letter informing the victim "that the case has been referred to the prosecutors' office and explains and offers the services available from the country office of victim-witness advocacy."[237] Subsequent letters to the victim ensure that the victim has notice of a series of decisions long before indictment,[238] and the office actively solicits information in order to "help the prosecutor's office decide whether or not to prosecute a case."[239] Along a similar vein, the Massachusetts legislature included a provision that makes it clear that nothing should prevent a prosecutor from providing victim services to persons injured by the commission of a crime, even though a complaint or indictment has not yet been issued.[240]

In addition to extending rights before the filing of charges, several states require consultation before the prosecutor reaches a plea agreement with the defendant. For example, Idaho's statute provides that a victim must be given an opportunity "to communicate with the prosecution in criminal or juvenile offenses, and be advised of any proposed plea agreement by the prosecuting attorney prior to entering into a plea agreement in criminal or juvenile offenses involving crimes of violence, sex

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[235] COLO. CONST. art. II, § 16a; COLO. REV. STAT. § 24-4.1-302(1) (2013). *But see* COLO. REV. STAT. § 24-4.1-302.5(1)(f) (2012) (limiting conferral right, in particular, to later stages of a criminal proceeding). Despite these limitations on the conferral right, victims retain the ability to be heard at any hearing involving a plea. *See id.* § 24-4.1-302.5.

[236] MO. ANN. STAT. § 595.209(10) (West 2011).

[237] OFFICE OF VICTIM-WITNESS ADVOCACY, N.J. DEP'T OF LAW & PUB. SAFETY, A CRIME VICTIM'S GUIDE TO THE CRIMINAL JUSTICE SYSTEM 4 (2d ed. 1997); *see also* N.J. CONST. art. I, § 22. *Compare* 18 U.S.C. § 3771 (2012), *with* N.J. STAT. ANN. § 52:4B-36 (West 2009). In addition to the rights similar to the federal legislation, New Jersey law provides for the right "[t]o be advised of case progress and final disposition and to confer with the prosecutor's representative so that the victim may be kept adequately informed . . . ." *Id.* § 52:4B-36(k).

[238] *See* OFFICE OF VICTIM-WITNESS ADVOCACY, *supra* note 237, at 4 (including pre-grand jury remand, administrative dismissal, grand jury remand, grand jury dismissal, and indictment returned).

[239] *Id.* at 26 (describing victim involvement at grand jury and arraignment stages of the proceeding).

[240] *See* MASS. ANN. LAWS ch. 258B, § 2 (LexisNexis 2004).

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crimes or crimes against children."[241] In Indiana, the plain language of its statute leaves open the possibility of a conferral right before formal charges to the extent that the statute includes two separate time frames: "after a crime . . . has been charged" *or* "before any disposition of a criminal case involving the victim."[242]

To be sure, not all states have afforded victims a voice throughout the entirety of the criminal justice process.[243] In some states, the statutes are ambiguous.[244] In a handful of states, there is clear language limiting rights until after the filing of charges. For example, Louisiana constrains the conferral right to criminal matters "in which formal charges have been filed by the district attorney's office."[245] Yet, unlike the federal CVRA, this statute specifically excludes pre-charging situations. And, in any event, despite Louisiana's limitation on a particular right within the statute, the legislature in this state still often saw fit to provide the victim with notification rights, even in the absence of the formal filing of charges.[246]

Very few state courts have ever considered the precise issue of whether conferral rights may attach prior to the formal filing of charges. This is likely caused by the fact that, unlike the federal statute, many state statutes fail to provide the victim with a procedural mechanism for challenging the conduct of prosecutors or law enforcement agencies.[247] However, in rare cases, state courts have implicitly recognized that a meaningful interpretation of victims' rights should include some rights prior to filing.

For example, a Connecticut court concluded that a company injured by the delinquent act of a minor was entitled to information about the case

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[241] IDAHO CODE ANN. § 19-5306(1)(f) (2004). As in the case of most of the state statutes, the Idaho statute is not without ambiguity. A different provision within the statute makes the notification right contingent "[u]pon the filing of a criminal complaint or juvenile petition . . . ." *Id.* § 19-5306(2).

[242] IND. CODE ANN. § 35-40-5-3(b) (West 2012); *id.* § 35-40-1-1 (failing to define "case").

[243] *See, e.g.*, MD. CONST. art. 47(b) ("In a case originating by indictment or information filed in a circuit court, a victim of crime shall have the right to be informed . . . .").

[244] In Delaware, for example, the statute contains an additional limitation in the conferral provision that is noticeably absent from the duty imposed on law enforcement to provide information about the victim's rights to that victim. *Compare* DEL. CODE ANN. tit. 11, § 9405 (2007), *and* DEL. CODE ANN. tit. 11, § 9411 (2007) (imposing additional requirements after the Attorney General commences the prosecution), *with* DEL. CODE ANN. tit. 11, § 9410 (2007). Query whether the limitations imposed in one section should be inferred in the other under the doctrine of *expressio unius est exclusio alterius*.

[245] LA. REV. STAT. ANN. § 1844(D)(1) (2010).

[246] *See id.* § 1844.

[247] *See generally* Douglas E. Beloof, *The Third Wave of Crime Victims' Rights: Standing, Remedy, and Review*, 2005 BYU L. REV. 255, 300–23 (discussing problems with remedies in victims' rights statutes).

contained in a police file in a civil proceeding, even though it appears that there was little indication that criminal charges had been filed.[248] Similarly, the South Carolina Supreme Court, while limiting the ability of the victim to challenge the conduct of a prosecutor, concluded that the same rights under the state constitution must attach prior to the formal filing of an indictment.[249] Other courts have even permitted a victim to recover compensation or reparations for unindicted or acquitted conduct.[250]

In other words, while few state judiciaries have addressed the precise timing of state crime victims' rights, those that have addressed the question have typically found that the rights do extend to pre-charging situations.

Despite the relative dearth of state court cases, it is worth noting that most state statutes unequivocally provide for notification rights early in the criminal process.[251] For example, the Illinois statute imposes a limited duty on law enforcement agencies to keep victims informed of the status of an investigation until the accused is apprehended or the agency discontinues the investigation.[252] Similarly, law enforcement agencies in Iowa must keep the victim apprised of the investigation "until the alleged assailant is apprehended or the investigation is closed."[253] Michigan's statute requires law enforcement to provide information within a mere twenty-four hours of contact between the agency and the victim.[254]

In sum, while state law on crime victims' rights before charging is not fully developed, what law exists tends to support the position that crime victims deserve rights before the formal filing of charges. This law fits the long-standing trend in states toward expanding protections for crime

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[248] *See In re* James B., Jr., 714 A.2d 735 (Conn. Super. Ct. 1998).

[249] *See Ex parte* Littlefield, 540 S.E.2d 81, 85 (S.C. 2000).

[250] *See* Kimberly J. Winbush, Annotation, *Persons or Entities Entitled to Restitution as "Victim" Under State Criminal Restitution Statute*, 92 A.L.R. 5TH 35, 35 (2001) (recounting cases in which unnamed victims were entitled to restitution).

[251] *See, e.g.*, MINN. STAT. ANN. § 611A.0315(a) (West 2009) (requiring a prosecutor to "make every reasonable effort to notify a victim of domestic assault . . . or harassment that the prosecutor has decided to decline prosecution of the case" but providing the right to participate in proceedings to circumstances in which the offender has been charged).

[252] *See* 725 ILL. COMP. STAT. ANN. 120/4.5 (2008).

[253] IOWA CODE ANN. § 915.13(1)(f) (West 2003).

[254] *See* MICH. COMP. LAWS ANN. § 780.753 (West 2007). Michigan's conferral right is particularly ambiguous, because the notification requirement imposed upon the prosecuting attorney contains a time limitation (after arraignment), but the legislature did not include an express time limitation on the conferral right. *See* MICH. COMP. LAWS ANN. § 780.756(3) (West 2007) (requiring the victim have the opportunity to consult prior to "any negotiation that may result in a dismissal, plea or sentence bargain, or pretrial diversion"); *see also* MISS. CODE ANN. § 99-43-7(1) (2007) (imposing a requirement on law enforcement officials to notify a victim within seventy-two hours).

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victims.[255] The decision by state legislators to extend notification or conferral rights to crime victims demonstrates an express recognition that crime victims' meaningful participation in the criminal justice process may involve granting those victims rights before indictment.

CONCLUSION

Crime victims have important rights at stake in the criminal justice process, even before prosecutors formally file criminal charges. It is hardly surprising, therefore, to find that a federal law that Congress in fact designed to create "broad and encompassing" rights for victims protects victims during a criminal investigation. As this Article has explained, interpreting the CVRA to cover crime victims during the pre-charging phase of a case is consistent with the statute's purposes, text, legislative history, and interpretive case law. And state criminal justice systems also appear to be moving in that direction.

The Justice Department's contrary interpretation seems unlikely to prevail when challenged. The CVRA signals a paradigm shift in the way that crime victims are to be treated, at least within the federal criminal justice system. Before enactment of the law, federal investigators and prosecutors might have been able to keep victims at arm's length, refusing to confer with them about the case and otherwise ignoring or even mistreating them during the process. But those days are over. The CVRA promises victims that they now have the right to confer with prosecutors and the right to be treated fairly while their cases are investigated. It is time for the Department of Justice to recognize and embrace that new reality.

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[255] *See* Jeffrey A. Parness et al., *Monetary Recoveries for State Crime Victims*, 58 CLEV. ST. L. REV. 819, 850 (2010); Tobolowsky, *supra* note 221, at 59 (describing a "significant expansion of victim rights to be consulted by the prosecutor and heard by the court").

EXHIBIT 1

To

JANE DOE NO. 1 AND JANE DOE NO. 2'S RESPONSE IN OPPOSITION TO MOTION FOR LEAVE TO FILE SUPPLEMENT TO REPLY IN SUPPORT OF MOTION FOR LIMITED INTERVENTION BY ALAN M. DERSHOWITZ

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

Case No. 9:08-80736-Civ-Marra/Johnson

JANE DOE #1 and JANE DOE #2

v.

UNITED STATES
_____/

JANE DOE NO. 1 AND JANE DOE NO. 2'S RESPONSE TO SUPPLEMENT IN SUPPORT OF MOTION FOR LMITED INTERVENTION BY ALAN M. DERSHOWITZ

COME NOW Jane Doe No. 1 and Jane Doe No. 2 (the "current victims"), by and through undersigned counsel, to file this response to the Supplement to Reply in Support of Motion for Limited Intervention by Alan Dershowitz (DE 317-1). Dershowitz claims that an affidavit submitted by Jane Doe No. 3 in support of an unrelated pleading proves that she is "lying with respect to her claims against [him]." DE 317-1 at 1. The affidavit proves nothing of the sort. Indeed, if recent pleadings show anything, it is that Dershowitz continues to hide the truth about his activities.

Before turning to the specifics of what Dershowitz argues in his supplement, it is even more important to consider what he *fails* to argue. In neither his original reply (DE 306) nor his recent supplement (DE 317-1) has Dershowitz provided specific evidence to contest Jane Doe No. 3's allegations that he sexually molested her. This omission is revealing, because Dershowitz has repeatedly claimed in the media that he has irrefutable proof that her allegations are false. For example, on January 7, 2015, on the Fox Business (Lou Dobbs) program, Dershowitz stated: "I did the investigation in a day and was able to prove through *all kinds of*

records that I couldn't have been in these places. The woman is a serial liar. If [Cassell and Edwards] had done that investigation, they would have come to the same conclusion."[1] Similarly, on January 8, 2015, on the Greta van Susteren show on FOX, Dershowitz claimed: "Now I can prove through *documentary evidence* that I was never at the times and places she [Jane Doe No. 3] alleges she had sex with me."[2] Yet despite having publicly claimed to have "all kinds of records" and "documentary evidence" that "prove" Jane Doe No. 3 is lying, Dershowitz has yet to produce a single document to this Court. Dershowitz's intransigence is not limited to this case, as he has also refused to comply with discovery requests in a parallel defamation action in state court. His refusal has led to a pending motion to compel. *See* Plaintiff's Motion to Compel Production of Documents, *Edwards v. Dershowitz*, No. CACE 15-000072 (Feb. 23, 2015) (attached as Exhibit 1) ("despite having had 45 days to gather materials that allegedly provide 'absolute proof' than he has never even met Jane Doe No. 3 – and despite having told numerous media sources that he had already collected such information – Dershowitz has provided none of these documents . . . .").[3] The Court should draw the obvious inference that Dershowitz, despite making broad claims to the media, has no such evidence to produce – because Jane Doe No. 3's allegations are true.

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[1] http://video.foxbusiness.com/v/3976630676001/alan-dershowitz-the-woman-is-a-serial-liar/? - sp=show-clips.

[2] http://radio.foxnews.com/2015/01/08/greta-alan-dershowitz-this-time-its-personal/.

[3] Jane Doe No. 3 explained in her earlier response that the Court should not allow Dershowitz to intervene here because he can protect his (alleged) reputational interests in the pending defamation action. DE 291 at 11-12). The Court may be interested to learn that Dershowitz has recently filed a counterclaim against Edwards and Cassell for defaming him in that action – suggesting he can litigate his reputational interests there, and thus has no need to do so here.

In his most recent supplemental filing with this court (DE 317-1), Dershowitz twists the facts and jumps to conclusions in service of his crusade against Jane Doe No. 3. For example, Dershowitz notes that Jane Doe No. 3 told attorney Edwards before April 2011 that Dershowitz had abused her, but then says "she and Edwards sat on this highly charged accusation for three years and eight months before first using it in their [sic] pleading filed on December 30, 2014. This constitutes laches that prejudiced . . . Dershowitz . . . ." DE 317-1 at 2. Dershowitz ignores the key fact that in April 2011, attorney Edwards did not represent Jane Doe No. 3. Accordingly, he could not "sit" on her claims against Dershowitz because he was not empowered, at that time, to pursue them.[4]

With regard to the claim of laches, Dershowitz argues that he has been prejudiced because if the allegations had been filed earlier, "he would have been in a far better position to secure travel and other records needed to disprove these charges." DE 317-1 at 2. But, as noted above, Dershowitz has already told worldwide news media that he has already collected all of the records and can provide irrefutable, documentary proof that Jane Doe No. 3 is lying. For example, Dershowitz has told the *Boston Globe* that "he will use his travel and credit card records, which he said he has fastidiously saved, to refute the allegations against him."[5]

---

[4] Nor did Jane Doe No. 3 sit on any claims against Dershowitz, notably claims relating to the CVRA case. In 2011, Jane Doe No. 3 lacked legal counsel regarding the CVRA claim. It was not until her recent return from Australia to the United States that she understood the claims involved in the CVRA action and obtained legal counsel to pursue them. *See* DE 310-1 at 8, ¶ 57.

[5] "Dershowitz 'thrilled' to be sued for defamation," *Boston Globe* (Jan. 7, 2015), available at, http://www.bostonglobe.com/metro/2015/01/06/sued-for-defamation-dershowitz-thrilled-chance-question-lawyers-sex-crime-accuser/21QibSrwNC343eKMadWNeL/story.html.

Dershowitz can't have it both ways – simultaneously claiming he has the records and that he is harmed in collecting them – and the Court should not credit his conflicting positions.

CONCLUSION

The Court should deny Dershowitz's motion to intervene.

DATED: March 24, 2015

Respectfully Submitted,

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CERTIFICATE OF SERVICE

I certify that the foregoing document was served on March 24, 2015, on the following using the Court's CM/ECF system:

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/s/ Bradley J. Edwards

EXHIBIT 1

IN THE CIRCUIT COURT OF THE
SEVENTEENTH JUDICIAL CIRCUIT, IN
AND FOR BROWARD COUNTY, FLORIDA

CASE NO.: CACE 15-000072

BRADLEY J. EDWARDS and PAUL G.
CASSELL,

Plaintiff(s),

vs.

ALAN M. DERSHOWITZ,

Defendant(s).
_____/

PLAINTIFFS' MOTION TO COMPEL PRODUCTION OF DOCUMENTS

Plaintiffs, Bradley J. Edwards and Paul G. Cassell, by through their undersigned attorneys, move to compel production of documents relevant to this action that defendant Alan M. Dershowitz has refused to produce.

Dershowitz has told numerous media sources that he has collected documents that provide "absolute proof" that he has not sexually abused a minor woman known as "Jane Doe No. 3." And yet despite having received a valid discovery request for these and other related documents more than 45 days ago, Dershowitz has refused to produce these documents to Edwards and Cassell. Indeed, he has refused to produce *any* documents to them. Accordingly, the Court should direct Dershowitz to produce these materials forthwith, as well as order him to pay reasonable costs and attorneys' fees necessitated by his refusal to make any appropriate document production.

FACTUAL BACKGROUND

On December 30, 2014, Jane Doe No. 3 filed a motion (and later a corrected motion) seeking to join a case in the U.S. District Court for the Southern District of Florida, *Jane Doe Nos. 1 and 2 v. United States*, No. 9:08-cv-80736. She was represented by two attorneys who specialize in (among other things) representing crime victims, Bradley J. Edwards and Paul G. Cassell. The case involved an attempt to rescind a non-prosecution agreement (NPA) barring the prosecution of Jeffrey Epstein and his criminal associates on grounds that the victims' rights under the Crime Victims Rights Act (CVRA) had been violated.

In her corrected motion, Docket Entry (DE) 280, Jane Doe No. 3 briefly proffered the circumstances that would qualify her as a "victim" eligible to assert rights under the CVRA. *See* 18 U.S.C. 3771(e) (defining a CVRA "victim"). Jane Doe No. 3 briefly explained that when she was a minor, Jeffrey Epstein had trafficked her to Prince Andrew and Alan Dershowitz (among others) for sexual purposes. The motion also provided specific reasons why Jane Doe No. 3's participation was relevant to the case, including the pending discovery issues regarding Prince Andrew and Dershowitz. *See* DE 280 at 9-10 (explaining several reasons participation of new victims was relevant to existing issues).

After the motion was filed, Dershowitz made numerous media statements about the filing – and defamatory statements about Edwards and Cassell. For example, on CNN on January 5, 2015, Dershowitz stated that Edwards and Cassell are "prepared to lie, cheat, and steal. These are unethical lawyers."

http://www.cnn.com/videos/world/2015/01/05/wrn-uk-sex-abuse-allegations-alan-dershowitz-intv.cnn

In the course of defaming Edwards and Cassell, Dershowitz also made numerous representations that he had collected documents proving that he had never even met Jane Doe No. 3, much less sexually abused her. For example, on the same CNN program on January 5, Dershowitz stated: "No, never met her [Jane Doe No. 3], I didn't know what she looked like until I saw her photograph. . . . I have a superb memory. I have a memory of not having met her. *I did not meet her.* And believe me, I remember everybody I've ever had sex with. . . . *I can prove it by flight records. I can prove it by my travel records.*" *Id.* (emphasis added). Dershowitz went on to say that disproving Jane Doe No. 3's allegations was a simple task requiring about one hour of work: "If they [Edwards and Cassell] had just done an hours' worth of work, they would have seen she is lying through her teeth." *Id.*

That same day, on NBC's *Today Show*, Dershowitz repeated his claim that it was a simple matter to collect documents disproving allegations made by Jane Doe No. 3:

> Her lawyers Paul Cassell, a former Federal judge and Brad Edwards, deliberately and willfully filed this pleading which they knew I had no opportunity to respond to in court, without doing any investigation, *if they had simply investigated the manifests of the airplanes, if they had checked my travel records*, if they had asked me and I could have given the names of these people who are witnesses, *they would know the stories, totally, completely false.*

https://www.youtube.com/watch?v=ZXePKTws0f0

Two days later, Dershowitz told Lou Dobbs on Fox Business, that he had already completed his investigation and had "all kinds of records" proving that Jane Doe No. 3 was a liar:

> They [Edwards and Cassell] did it for crass financial and political reasons. More to the point is [what] they didn't do... *I did the investigation in a day and was able to prove through all kinds of records that I couldn't have been in these places.* The woman is a serial liar. If they had done that investigation, they would have come to the same conclusion.

http://video.foxbusiness.com/v/3976630676001/alan-dershowitz-the-woman-is-a-serial-liar/?sp=show-clips.

In response to the CVRA motion that Edwards and Cassell had made for Jane Doe No. 3, on January 5, 2015, Dershowitz filed a motion to intervene in the case to respond, along with an affidavit claiming that he had not sexually abused Jane Doe No. 3. In that affidavit, Dershowitz stated that "[i]f [Edwards and Cassell] had done any reasonable investigation of their client's false allegations, they would have found *absolute proof* that I did not [sexually abuse her] . . . even the most minimal of investigation would have proven conclusively that I could not have had sex with their client on Mr Epstein's island, in New Mexico or on the airplanes; and that I did not have sex with her in his New York or Palm Beach homes." DE 282-1 at ¶ 8.

On January 6, 2015, plaintiffs Edwards and Cassell filed their complaint in this action, alleging a massive public assault on their character by defendant Dershowitz. On January 9, 2015, Edwards and Cassell filed their Initial Request for Production to Defendant Alan M. Dershowitz. They requested production of documents along the lines that Dershowitz suggested he had already collected. For example, Request for Production (RFP) No. 9 sought "[copies of

any and all 'absolute proof' as described in paragraph 8 of the sworn declaration of Alan M. Dershowitz."

On February 11, 2015, counsel for Edwards and Cassell sent an email to counsel for Dershowitz, noting that discovery production was past due and inquiring as to whether a motion to compel would be necessary. That same day, a paralegal for Cole, Scott & Kissane confirmed that appropriate production would be made by the end of the week. Shortly after, an attorney for Dershowitz disavowed that commitment, and indicated that Dershowitz would make his productions by February 23, 2015.

On February 23, 2015 – 45 days after the discovery requests had been served – Dershowitz responded. With regard to the request for production of documents, Dershowitz produced no documents whatsoever. Instead, he made a vague commitment to produce unspecified documents at some unspecified time in the future. Illustrative of Dershowitz's failure to make any substantive production is the following request for production and Dershowitz's answer:

> 9. Copies of any and all "absolute proof" as described in paragraph 8 of the sworn Declaration of Alan M. Dershowitz.
>
> RESPONSE: Defendant objects to this Document Request to the extent that Plaintiffs seek to alter or shift any burdens of proof as a matter of law in this action. Subject to and without waiving the foregoing specific objections and General Objections, *Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.*

Dershowitz made the same evasive response – "Defendant responds that he will produce" unspecified "non-privileged documents" – to multiple discovery requests. *See* Dershowitz

Response to Requests for Production 1, 2, 3, 4, 5, 6, 9, 10, 13, 14, 15, 16, 19, 20, 21, 22, and 23. To permit the Court to review the extent of Dershowitz's evasions, a copy of his responses is attached to this pleading as Exhibit A.

In short, despite having had 45 days to gather materials that allegedly provide "absolute proof" that he has never even met Jane Doe No. 3 – and despite having told numerous media sources that he had already collected such information – Dershowitz has produced none of these documents to Edwards and Cassell. He has also made blanket assertions of a variety of privileges, but has produced no privilege logs.

CONCLUSION

Accordingly, Edwards and Cassell request:

1. That Dershowitz be directed to produce all materials covered by the discovery requests forthwith;

2. That Dershowitz be held to have waived any and all otherwise applicable privileges as a consequence of his failure to timely file a privilege log; and

3. That Dershowitz be ordered to pay reasonable costs and attorneys' fees associated with the need to file this motion to compel.

CERTIFICATE OF GOOD FAITH EFFORT TO RESOLVE

Plaintiffs have attempted in good faith to resolve the discovery issues presented in this motion (and others) as evidenced by the letter attached as Exhibit B. The Defendant has failed to respond as of the time of the filing of this motion.

Edwards, Bradley vs. Dershowitz
Case No.: CACE 15-000072
Plaintiffs' Motion to Compel Production of Documents

I HEREBY CERTIFY that a true and correct copy of the foregoing was sent via E-Serve to all Counsel on the attached list, this 2ND day of March, 2015.

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IN THE CIRCUIT COURT OF THE
SEVENTEENTH JUDICIAL CIRCUIT
IN AND FOR BROWARD COUNTY, FLORIDA

CASE NO.: CACE 15-000072

EDWARDS, *et al.*,

Plaintiffs / Counterclaim Defendants,

v.

DERSHOWITZ,

Defendant / Counterclaim Plaintiff.
_____/

DEFENDANT / COUNTERCLAIM PLAINTIFF ALAN M. DERSHOWITZ'S OBJECTIONS AND RESPONSES TO PLAINTIFFS' INITIAL REQUESTS FOR PRODUCTION

Defendant/Counterclaim Plaintiff Alan M. Dershowitz ("Defendant") submits the following objections and responses to the Plaintiffs' Initial Request for Production ("Document Requests") propounded by Plaintiffs/Counterclaim Defendants Bradley J. Edwards and Paul G. Cassell ("Plaintiffs").

PRELIMINARY STATEMENT

These responses and objections reflect the current state of Defendant's knowledge regarding the matters discussed herein. Defendant has not completed his discovery or trial preparation in this matter. Accordingly, Defendant reserves the right to revise, correct, clarify, supplement, or amend his objections and responses to reflect information hereafter discovered or acquired. These responses and objections are provided without prejudice to the rights of Defendant to use or rely upon subsequently discovered information or documents at any time, including at trial. The fact that a Document Request has been complied with in part shall not be construed as a waiver of all or any part of any objection that Defendant might or could make to

EXHIBIT A

any Document Request propounded by Plaintiffs. Defendant further reserves the right to object to the admission in evidence of any and all information made available in response to the Document Requests on any ground, including, but not limited to, the ground that it is irrelevant and immaterial to the issues in this action.

GENERAL OBJECTIONS

1. The General Objections and statements in this section apply to each of Defendant's responses to the Document Requests set forth below and are not necessarily repeated in response to each individual Document Request.

2. By responding to the Document Requests, Defendant does not concede that any information requested is relevant to this action or admissible at trial. Defendant expressly reserves the right to object to further discovery on the subject matter of any of these Document Requests.

3. Defendant's responses set forth below include only documents located or obtained up to the date of service of the responses. Additional responsive, non-privileged documents may be ascertained or identified subsequently, and Defendant reserves the right to rely on such documents throughout this litigation and at trial.

4. Defendant objects to each Document Request to the extent that it calls for documents protected by the attorney-client privilege, the work-product doctrine, or any other applicable privilege or protection. By responding to any Document Request, Defendant does not waive any applicable privilege as to that Document Request or as to any other present or future discovery request.

5. Defendant generally objects to the Document Requests as unduly burdensome and oppressive to the extent that they ask Defendant to provide information that is beyond

Defendant's possession, custody, or control; is publicly available; is already in Plaintiffs' possession, care, custody, or control; or is generally available to Plaintiffs.

6. Defendant generally objects to the Document Requests to the extent that the information sought is not identified with sufficient particularity.

7. Defendant objects to the definition of "Documents" to the extent that it seeks the production of things beyond the scope of Rule 1.280 of the Florida Rules of Civil Procedure. Defendant further objects to the definition of "Documents" to the extent that it seeks "electronic data as well as application metadata and system metadata" and "inventories and rosters of your information technology (IT) systems – e.g., hardware, software and data, including but not limited to network drawings, lists of computing devices (servicers, PCs, laptops, PDAs, cell phones, with data storage and/or transmission features), programs, data maps and security tools and protocols" as overly broad and unduly burdensome.

RESPONSES TO REQUESTS

1. Copies of any and all documents reflecting or relating to any and all occasions on which you have been physically present on Little Saint James Island including but not limited to your visit to Little Saint James Island, as described in paragraph 3 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control relating to the sole occasion on which Defendant was physically present on Little Saint James Island.

2. Copies of any and all documents evidencing the presence of your wife and daughter on Little Saint James Island, as described in paragraph 3 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

3. Copies of any and all documents reflecting or relating to any and all occasions on which you have been physically present at Jeffrey Epstein's Ranch in New Mexico including but not limited to your visit to Jeffrey Epstein's Ranch in New Mexico, as described in paragraph 4 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control relating to the sole occasion on which Defendant was physically present at Jeffrey Epstein's Ranch in New Mexico.

4. Copies of any and all documents evidencing the presence of your wife and daughter at Jeffrey Epstein's Ranch in New Mexico, as described in paragraph 4 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

5. Copies of any and all documents evidencing the presence of your wife and daughter on Jeffrey Epstein's private plane, as described in paragraph 5 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

6. Copies of any and all documents evidencing the presence of your nephew on Jeffrey Epstein's private plane, as described in paragraph 5 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

7. Copies of any and all documents evidencing the presence of "members of Mr. Epstein's legal team", as described in paragraph 5 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Defendant objects to this Document Request as overly broad because Jane Doe #3 alleges in the filing titled "Jane Doe #3 and Jane Doe #4's Motion Pursuant to Rule 21 For Joinder In Action" (Doc. No. 279) (the "Joinder Motion") in the civil action captioned *Jane Doe #1, et al. v. United States*, Case No. 08-80736 (S.D. Fla.) (the "Federal Action") that she was "kept as [Jeffrey Epstein's] sex slave from about 1999 through 2002." Jane Doe #3 further alleges in the Joinder Motion that she "escape[d]" from Mr. Epstein and moved to Australia in 2002. Paragraph 5 of the sworn Declaration of Alan M. Dershowitz refers to plane travel by members of Mr. Epstein's legal team after 2002 and therefore Defendant further objects because this Document Request does not seek documents relevant to this action or documents reasonably calculated to lead to the discovery of admissible evidence.

8. Copies of any and all flight manifests reflecting your presence or the presence of any member of your family on any aircraft on which Jeffrey Epstein was also a passenger during the same flight.

RESPONSE:

Defendant responds that he has no responsive, non-privileged documents.

9. Copies of any and all "absolute proof" as described in paragraph 8 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Defendant objects to this Document Request to the extent that Plaintiffs seek to alter or shift any burdens of proof as a matter of law in this action. Subject to and without waiving the foregoing specific objections and General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

10. Copies of any and all documents supporting the allegation that "Jane Doe #3 is a serial liar" as described in paragraph 8 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

11. Copies of any and all documents tending to establish that President Clinton has never visited Jeffrey Epstein's island, Little Saint James, as described in paragraph 8 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Defendant objects to this Document Request because it misstates paragraph 8 of the sworn Declaration of Alan M. Dershowitz, which expressly states that "*on information and belief,* I have been advised that *Secret Service records* would confirm that President Clinton has never set foot on that island." (Emphasis added). Subject to and without waiving the foregoing specific objections and the General Objections, Defendant responds that he has no responsive, non-privileged documents.

12. Copies of any and all documents evidencing that Jane Doe #3 "has also told lies about many world leaders" as described in paragraph 8 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Defendant objects to this Document Request because it misstates paragraph 8 of the sworn Declaration of Alan M. Dershowitz, which expressly states that "*on information and belief,* [Jane Doe #3] has also told lies about many world leaders." (Emphasis added). Defendant further objects to this Document Request because it seeks documents already in Plaintiffs' possession and/or that are publicly available. Subject to and without waiving the foregoing specific objections and the General Objections, Defendant responds by reference to statements by Jane Doe #3 reflected in the media, which are equally available to Plaintiffs.

13. Copies of any and all documents evidencing that "the State Attorney in Palm Beach County dropped a case that she sought to bring based on an assessment by the investigating detective regarding the 'victim's lack of credibility'" including a copy of the letter reflecting this decision as described in paragraph 8 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Defendant objects to this Document Request because it misstates paragraph 8 of the sworn Declaration of Alan M. Dershowitz, which expressly states that "*on information and belief,* the State Attorney in Palm Beach County dropped a case that she sought to bring based on an assessment by the investigating detective regarding the 'victim's lack of credibility.' *A copy of the letter reflecting this decision was forwarded to central records.*" (Emphasis added). Subject to and without waiving the foregoing specific objections and the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

14. Copies of any and all documents evidencing that the attorneys for the Jane Does acted "in bad faith in an effort to have the media report it" as described in paragraph 9 of the sworn Declaration of Alan M. Dershowitz.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

15. Copies of any and all documents reflecting that Jane Doe #3 has charged President Bill Clinton with having sex with her on Jeffrey Epstein's Little Saint James Island.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

16. Copies of any and all documents reflecting that Jane Doe #3 has alleged that President Bill Clinton had sex or engaged in any inappropriate contact with her on the Island owned by Jeffrey Epstein.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

17. Copies of all pages of Passports held by you at any time during the past 12 years.

RESPONSE:

Defendant objects to this Document Request as seeking sensitive personal information and documents that are not relevant to the subject matter of the pending action.

18. Copies of any and all documents reflecting that Jane Doe #3 has ever willfully engaged in prostitution.

RESPONSE:

Defendant objects to this Document Request as vague because Defendant is not in a position to determine the willful nature of Jane Doe #3's prostitution. Defendant further objects to this Document Request because Jane Doe #3 has repeatedly and publicly asserted that she gave her body for sexual activity for hire after the age of 18 and agreed to secure other persons for the purpose of prostitution or for any other lewd or indecent act and therefore the Document Request is unduly burdensome.

19. Copies of any and all documents reflecting that Jane Doe #3 is either a liar or has perjured herself in any way.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

20. Copies of any and all documents tending to support your assertion that Bradley J. Edwards:

a. has a reputation of being sleazy;

b. has acted in a sleazy manner;

c. has engaged in unethical conduct;

d. has knowingly relied upon false statements in any legal document filed by him;

e. has engaged in any form of unethical conduct;

f. has engaged in any form of conduct tending to demonstrate a lack of fitness to engage in the practice of law;

g. has engaged in any form of conduct warranting the loss of his license to practice law or the imposition of any professional disciplinary action against him;

h. has acted in a corrupt manner;

i. failed to conduct any investigation of the allegations of Jane Doe #3 relating to you before referring to those allegations in a legal filing.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

21. Copies of any and all documents tending to support your assertion that Paul G. Cassell:

a. has a reputation of being sleazy;

b. has acted in a sleazy manner;

c. has engaged in unethical conduct;

d. has knowingly relied upon false statements in any legal document filed by him;

e. has engaged in any form of unethical conduct;

f. has engaged in any form of conduct tending to demonstrate a lack of fitness to engage in the practice of law;

g. has engaged in any form of conduct warranting the loss of his license to practice law or the imposition of any professional disciplinary action against him;

h. has acted in a corrupt manner;

i. failed to conduct any investigation of the allegations of Jane Doe #3 relating to you before referring to those allegations in a legal filing.

RESPONSE:

Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control.

22. Copies of any and all records for the period 1998-2007 reflecting or relating to travel by you and/or any member of your family on any aircraft, boat, helicopter, or other means of transport owned, controlled, or under the direction of Jeffrey Epstein and/or any business entity with which Jeffrey Epstein was affiliated at the time of travel.

RESPONSE:

Defendant objects to this Document Request as overly broad because Jane Doe #3 alleges in the Joinder Motion that she was "kept as [Jeffrey Epstein's] sex slave from about 1999 through 2002." Jane Doe #3 further alleges that she "escape[d]" from Mr. Epstein and moved to Australia in 2002. Therefore Defendant objects to this Document Request to the extent that it purports to seek documents relating to any time before 1999 or after 2002. Defendant further objects to this Document Request as overly broad and premature because Jane Doe #3 has not specified the dates on which she alleges Defendant engaged in misconduct on Mr. Epstein's plane, which are the sole relevant allegations by Jane Doe #3 or her counsel concerning travel on Mr. Epstein's plane that Defendant refutes and asserts are false. Subject to and without waiving the General Objections, Defendant responds that he will produce all responsive, non-privileged documents currently in his possession, custody or control relating to any occasions that may be specifically identified by Jane Doe #3 on which she contends that Defendant travelled on Jeffrey Epstein's plane between 1999 and 2002.

23. Copies of any and all records, including emails and text messages, between you and Jeffrey Epstein between December 29, 2014 and today, regarding allegations made by Jane Doe #3 of sexual misconduct by either of you.

RESPONSE:

Defendant objects to this Document Request to the extent that it seeks documents regarding allegations made by Jane Doe #3 of sexual misconduct by Jeffrey Epstein because such documents are not relevant to the subject matter of this action and would be attorney-client privileged communications in any event. Subject to and without waiving the foregoing specific

objections and the General Objections, Defendant responds that he will produce any responsive, non-privileged documents currently in his possession, custody or control.

Respectfully submitted,

/s/ Thomas E. Scott
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CERTIFICATE OF SERVICE

WE HEREBY CERTIFY that a true and accurate copy of the foregoing was served via E-Serve this 23rd day of February, 2015 to: Jack Scarola, Esquire, Searcy Denny et al., jsx@searcylaw.com and mep@searcylaw.com, counsel for Plaintiffs/Counterclaim Defendants.

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SHAREHOLDERS
*BOARD CERTIFIED

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[1] KENTUCKY
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VIA EMAIL
thomas.scott@csklegal.com

February 25, 2015

Thomas Emerson Scott, Jr., Esquire
Cole Scott & Kissane P.A.
9150 S Dadeland Boulevard, Suite 1400
Miami, FL 33156

Re: Edwards and Cassell vs. Dershowitz
Our File No.: 20150013

Dear Tom:

I write in the hope of amicably resolving a number of issues that arise in connection with the discovery responses you have provided in the referenced matter.

Responding "Subject to and Without Waiving" Objections and Claims of Privilege

It is a common and improper tactic to state "general objections" (or even specific ones) and then to respond to every request "subject to" those objections or claims of privilege. We cannot accept such responses. When this occurs, even if responsive information is forthcoming, we have no guarantee that you have not unilaterally withheld information subject to the stated objections or claims of privilege; in other words, it shields the very existence of responsive matters from discovery without any ability to assess the merits of the objection or claim of privilege as applied to the ostensibly protected matters. A federal court described the problem:

> This Court has on several occasions "disapproved [of] the practice of asserting a general objection 'to the extent' it may apply to particular requests for discovery." This Court has characterized these types of objections as "worthless for anything beyond delay of the discovery." Such objections are considered mere "hypothetical or contingent possibilities," where the objecting party makes '"no meaningful effort to show the application of any such theoretical objection' to any request for discovery."

EXHIBIT B

> Thus, this Court has deemed such "ostensible" objections waived or [has] declined to consider them as objections.

Sonnino v. *Univ. of Kan. Hosp. Auth.,* 221 F.R.D. 661, 666-67 (D. Kan. 2004) (citations omitted).

Of course, where claims of privilege are involved, the response must include a privilege log enabling us (and the court, if necessary) to assess the applicability of the privilege claimed. *See* Fla. R. Civ. P. 1.280(b)(5). Under Florida law, "the burden is upon the party asserting a privilege to establish the existence of each element of the privilege in question." *Fla. Sheriff's Self-Ins. Fund v. Escambia County,* 585 So.2d 461, 463 (Fla. 1st DCA 1991).

General or blanket objections are inappropriate in and of themselves: "A 'blanket' objection to interrogatories consisting of many, separate questions is insufficient. Objections in such a case should be addressed 'to a particular interrogatory or class of interrogatories, not to the interrogatories in general." *Twadell v. Twadell,* 199 So. 2d 501 (Fla. 4th DCA 1967) (quoting *Carson* v. *City of Ft. Lauderdale,* 173 So.2d 743 (Fla. 2d DCA 1965)).

The same principles apply to the general objections you have raised to our production requests.

Boilerplate Objections

A boilerplate objection such as "overbroad, burdensome, and not reasonably calculated to lead to the discovery of admissible evidence," baldly asserted, is "patently without merit." Such "stonewalling tactics" constitute discovery abuse. *First Healthcare Corp. v. Hamilton,* 740 So.2d 1189, 1193 (Fla. 4th DCA 1999); *see also First City Devs. Of Fla., Inc. v. Hallmark of Holly Condo. Ass 'n,* 545 So.2d 502, 503 (Fla. 4th DCA 1985) (noting that conclusory objections such as "burdensome" and "not reasonably calculated ..." are "words of the art [that] have little meaning without substantive support, ..").

Every burdensome objection you have raised is required to be supported by an affidavit detailing the extent of the burden claimed to preclude a substantive response.

Asserting Privilege for Non-Existent Documents

It is inappropriate to assert a claim of privilege or immunity for non-existent materials. *Greenleaf v. Amerada Hess Corp.*, 626 So.2d 263, 264 n.1 (Fla. 4th DCA 1993). We must assume that the privilege is asserted for a reason, i.e., that responsive and ostensibly privileged information in fact exists, else the privilege would not have been asserted. It follows that a privilege log must accompany all such responses.

Claiming Undue Burden for Non-Existent Materials

Likewise, objecting on basis of burdensomeness and later conceding an opponent's right to materials or later claiming materials do not exist constitute abusive discovery practices. *First Healthcare Corp. v. Hamilton,* 740 So.2d 1189, 1194 (Fla. 4th DCA 1999).

Custody, Possession & Control

Fla. R. Civ. P. reaches all documents (broadly defined and specifically including electronic data) in your client's "custody, possession, or control." Custody and possession are self-explanatory. "Control" is broader; it "means the legal right to obtain, even from nonparties. The concept of 'control' generally has been held to mean the legal right to obtain the requested documents. Parties thus can be requested to produce documents in the hands of their attorney, insurer, subsidiary, or another person outside the jurisdiction of the court." Lawrence M. Watson, Jr. & Michael S. Orfinger, *Fla. Civil Practice Before Trial § 16.60 (1993 ed.)* (citing 8 Wright & Miller, *Fed. Practice & Procedure* £16-10 (1998 ed.). A recent federal court case construing Fed. R. Civ. P. 41 (on which Fla. R. Civ. P. 1.350 is patterned), explained:

> The term "control" comprehends not only possession but also the right, authority, or ability to obtain the documents. Accordingly, Rule 34(a) allows a party seeking discovery to require production of documents beyond the actual possession of the opposing party if such party has retained "any right or ability to influence the person in whose possession the documents lie." [A] party is deemed to have control over documents held on its behalf by its attorneys. A party is also deemed to have control over financial records of the party that are in the possession of the party's accountant.

MGP Ingredients, Inc. v. *Mars, Inc.*, 2007 WL 3353401 (D. Kan. 2007) (citation omitted); *see also In Re Ski Train Fire of November 11, 2000 Kaprun Austria,* 2006

WL 1328259, at *5 (S.D.N.Y. 2006) ("Courts have long construed the term 'control' as meaning more than simple 'possession.' 'Control has been construed broadly by the courts as the legal right, authority, or practical ability to obtain the materials sought upon demand.'"). *See also Frantz v. Golebiewski,* 407 So.2d 283, 285 n.4 (Fla. 3 DCA 1981) ("Interpretations of the federal rule are persuasive in considering its Florida equivalent.").

While your responses purport to recognize the obligation to produce documents subject to Mr. Dershowitz's "control", there are qualifications in the responses that would appear to contradict that recognition. Your objection to the production of metadata has no legal foundation.

Word Play and Gamesmanship

You will note that we do not include page after page of definitions. I believe that any lawyer reasonably fluent in English can carry out his or her duty to construe interrogatories and requests for production in the broad and liberal manner intended by the rules. Florida courts frown on parsing and gamesmanship. See, e.g. *First Healthcare Corp. v. Hamilton,* 740 So.2d 1189, 1194 (Fla. 4th DCA 1999) (chastising counsel who did not turn over "event" reports because plaintiff requested "incident" reports as engaged in "little more than a semantic shell game.").

Repeated assertions that statements were made by Mr. Dershowitz "upon information and belief" is an example of prohibited "word play." That qualification has no bearing on the Defendant's discovery obligations.

"Will Produce"

The Rules of Civil Procedure require production and not just a commitment of production at some unspecified future date. If the documents you intend to produce are available for inspection and copying now as they are required to be, we are prepared to pick them up immediately. If they are not immediately available, when will they be?

Timeframe Objections

Your repeated attempts to restrict discovery to a narrow timeframe, fail to account for the fact that this is a defamation action arising out of broad defamatory statements made by Mr. Dershowitz impugning the honesty and integrity of the Plaintiffs without any limitations as to a specific time or circumstance. Mr. Dershowitz has also made broad public denials of misconduct unrestricted to any specific timeframe. We are entitled to

test the accuracy of those statements and to explore the full extent of the personal relationship he has had with Jeffrey Epstein.

Evasive Answers

The response to Interrogatory #2 is a typical example of an evasive response. Rather than address the substance of the questions posed, the Defendant engages in a four page diatribe about the alleged impropriety of naming him in a CVRA filing on behalf of Jane Doe #3. If that is the only improper conduct in which the Defendant contends Bradley Edwards has engaged, then the Defendant is obliged to say so.

Interrogatory #3 asks for the specific content of statements and the names of every witness to the making of the statements. We get a vague reference to "such comments" and references to the inability to "recall all of the people." Not a single witness' name is disclosed. If the Defendant is unable to identify a single person he is obliged to unequivocally say so.

Refusing to Provide Substantive Responses Until Jane Doe #3 is Deposed

This objection has absolutely no legal basis and fails to recognize that this is a defamation action against Dershowitz and not Mr. Dershowitz's defamation action against Jane Doe #3. This action is absolutely <u>not</u> dependent on the accuracy of the statements made by Jane Doe #3, although the Plaintiffs were and are confident of the accuracy of those statements.

Objecting Because You Think We Already Know the Answers

See for example the Response to Interrogatory #13. There is no legal basis for refusing to provide information because the Defendant believes the Plaintiff already knows the answer or has alternative sources to ascertain some or all of the information requested. An admission from an opposing party carries legal significance that other evidence does not have. We are entitled to Dershowitz's sworn responses regardless of what flight logs purport to show.

Incomplete Answers

See, for example, Interrogatory #15. A question that asks for names, addresses, and telephone numbers, is not properly responded to if all we get is, "Thomas and Joanne Ashe, as well as Defendant's wife and daughter."

and we will file an appropriate motion to compel. I would like to focus on substantive disagreements, obtain quick and fair rulings on them, and move on.

Sincerely,

JACK SCAROLA
JS/mep

cc: Bradley Edwards, Esq.
Paul G. Cassell, Esq.

United States District Court
Southern District of Florida

Virginia L. Giuffre,
Plaintiff,

Case No.: 9:16-mc-81608-DMM
Underlying Case No.: 15-cv-07433-RWS
(Southern District of New York) (Sweet, J.)

v.
Jeffrey Epstein,

Defendant.
_____/

PLAINTIFF'S SEALED DECLARATION IN SUPPORT OF PLAINTIFF'S REPLY IN SUPPORT OF PLAINTIFF'S MOTION TO COMPEL THE PRODUCTION OF DOCUMENTS AND TESTIMONY FROM JEFFREY EPSTEIN

I, Sigrid McCawley, declare that the below is true and correct to the best of my knowledge as follows:

1. I am a Partner with the law firm of Boies, Schiller & Flexner LLP and duly licensed to practice in Florida and before this Court pursuant to this Court's Order granting my Application to Appear Pro Hac Vice.

2. I respectfully submit this Declaration in Support of Plaintiff's Sealed Reply Motion to Compel the Production of Documents and Testimony from Jeffrey Epstein.

3. Attached hereto as Sealed Exhibit 1 is a true and correct copy of [redacted]'s Phone Records (GIUFFRE006258-GIUFFRE006260).

4. Attached hereto as Sealed Exhibit 2 is a true and correct copy of Jeffrey Epstein's Contact List.

5. Attached hereto as Sealed Exhibit 3 is a true and correct copy of Message Pads Excerpts.

6. Attached here to as Sealed Exhibit 4 is a true and correct copy of Ghislaine

HOUSE_OVERSIGHT_014118

Maxwell Phone List.

7. Attached hereto as Sealed Exhibit 5 is a true and correct copy of Excerpts from June 28, 2016 Deposition of Tony Figuerora.

8. Attached hereto as Sealed Exhibit 6 is a true and correct copy of Excerpts from May 18, 2016 Deposition of [redacted].

9. Attached hereto as Sealed Exhibit 7 is a true and correct copy of Jeffrey Epstein's DDA Statement History.

10. Attached hereto as Sealed Exhibit 8 is a true and correct copy of a Household Banking Account (GIUFFRE007840).

11. Attached hereto as Sealed Exhibit 9 is a true and correct copy of Nude Photographs.

12. Attached hereto as Sealed Exhibit 10 is a true and correct copy of Excerpts from June 20, 2016 Deposition of [redacted]

13. Attached hereto Sealed Exhibit 11 is a true and correct copy Excerpts from March 17, 2010 Deposition of Jeffrey Epstein.

I declare under penalty of perjury that the foregoing is true and correct.

Sigrid McCawley, Esq.

Dated: October 21, 2016.

Respectfully Submitted,
BOIES, SCHILLER & FLEXNER LLP

HOUSE_OVERSIGHT_014119

By: _____

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on the 21st day of October, 2016, I electronically filed the foregoing document with the Clerk of Court by using the CM/ECF system. I also certify that the foregoing document is being served to all parties of record via transmission of the Electronic Court Filing System generated by CM/ECF.

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Jeffrey Pagliuca, Esq.
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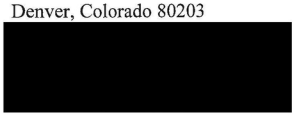

Sigrid S. McCawley

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EXHIBIT 1

[redacted]S CALLS

05-368
ATTACHMENT
12-29-05

DATE	NUMBER	REGISTERED TO :	TIME	OUT/IN
9/3/2005	561-714-0546	[redacted]	10:37A	OUT
9/3/2005	561-714-0547		10:40A	OUT
9/3/2005	561-776-5679	T A. Rofano	11:37A	IN
9/3/2005	561-655-2779	Jeffrey Epstein	1:53P	IN
9/3/2005	561-662-3098		1:55P	OUT
9/3/2005	561-389-6874		1:57P	OUT
9/4/2005	561-655-7626	Jeffrey Epstein	10:42A	OUT
9/6/2005	561-499-1718	S Rosen	8:08A	OUT
9/10/2005	[redacted]	[redacted]	4:43P	OUT
9/10/2005	561-655-7626	Jeffrey Epstein	7:53P	OUT
9/11/2005	561-655-7626	Jeffrey Epstein	8:03A	IN
9/14/2005	561-317-5844		8:25A	OUT
9/14/2005	561-317-5844		5:98P	OUT
9/14/2005	561-317-5844		7:27P	OUT
9/14/2005	561-317-5844		7:35P	IN
9/15/2005	[redacted]	[redacted]	10:17A	OUT
9/18/2005	561-818-8361		9:57A	OUT
9/18/2005	561-714-0546	[redacted]	9:58A	OUT
9/18/2005	[redacted]	[redacted]	9:59A	OUT
9/18/2005	[redacted]	[redacted]	10:00A	OUT
9/18/2005	[redacted]	[redacted]	10:03A	OUT
9/18/2005	561-662-3098		10:05A	OUT
9/18/2005	561-655-7626	Jeffrey Epstein	10:20A	OUT
9/18/2005	561-302-1844		10:44A	OUT
9/18/2005	561-389-6874		1:10P	OUT
9/18/2005	561-389-6874		4:10P	IN
9/18/2005	561-389-6874		4:10P	OUT
9/18/2005	561-302-1844		4:15P	IN
9/18/2005	[redacted]	[redacted]	5:17P	OUT
9/18/2005	561-714-0546	[redacted]	9:37P	OUT
9/18/2005	561-714-0546		9:45P	OUT
9/19/2005	[redacted]	[redacted]	10:29A	IN
9/19/2005	[redacted]	[redacted]	11:45A	IN
9/19/2005	[redacted]26	Jeffrey Epstein	1:54P	IN
9/19/2005	561-776-5679	T.A. Rofrano	2:01P	IN
9/20/200[redacted]		[redacted]	12:10A	IN
9/20/2005	561-317-5844		7:20P	IN
9/20/2005	561-317-5844		7:22P	IN
9/20/2005	561-317-5844		7:22P	IN
9/21/2005	561-818-8361		1:46P	IN

05-368

PLAINTIFF'S EXHIBIT 26

GIUFFRE006258
CONFIDENTIAL

9/21/2005	561-655-7626	Jeffrey Epstein	1:47P	IN
9/21/2005	561-655-7626	Jeffrey Epstein	1:48P	IN
9/28/2005	561-844-4112	ADVENTURE TIMES	11:29A	IN
9/29/2005	561-818-8361		9:07A	OUT
9/29/2005	[redacted]	[redacted]	12:41P	OUT
9/29/2005	[redacted]	[redacted]	12:43P	OUT
9/29/2005	[redacted]	[redacted]	12:46P	IN
9/29/2005	[redacted]	[redacted]	12:47P	OUT
9/30/2005	561-655-7626	Jeffrey Epstein	9:13A	IN
9/30/2005	561-655-7626	Jeffrey Epstein	10:29A	IN
9/30/2005	561-655-7626	Jeffrey Epstein	10:34A	IN
9/30/2005	[redacted]	[redacted]	7:06P	IN
10/1/2005	[redacted]	[redacted]	9:33A	OUT
10/1/2005	[redacted]	[redacted]	9:35A	IN
10/1/2005	561-655-7626	Jeffrey Epstein	9:44A	OUT
10/1/2005	561-655-7626	Jeffrey Epstein	9:45A	OUT
10/1/2005	561-574-0400		11:15A	OUT
10/1/2005	[redacted]	[redacted]	9:12P	OUT
10/1/2005	561-655-7626	Jeffrey Epstein	9:43P	OUT
10/1/2005	[redacted]	[redacted]	9:46P	OUT
10/2/2005	561-776-8748		10:31A	IN
10/2/2005	561-655-7626	Jeffrey Epstein	10:34A	OUT
10/2/2005	561-856-2617		11:40A	OUT
10/2/2005	[redacted]	[redacted]	11:41A	OUT
10/2/2005	[redacted]	[redacted]	11:42A	OUT
10/2/2005	561-655-7626	Jeffrey Epstein	11:43A	OUT
10/2/2005	561-655-7626	Jeffrey Epstein	3:03P	OUT
10/2/2005	[redacted]	[redacted]	4:32P	IN
10/2/2005	[redacted]	[redacted]	4:33P	OUT
10/2/2005	[redacted]	[redacted]	6:51P	OUT
10/2/2005	561-662-3098		9:38P	OUT
10/2/2005	561-662-3098		9:47P	IN
10/3/2005	561-302-1844		9:07A	OUT
10/3/2005	561-389-6874		9:10A	OUT
10/3/2005	561-302-1844		9:11A	IN
10/3/2005	561-655-7629	Jeffrey Epstein	9:14A	IN
10/3/2005	[redacted]	[redacted]	9:37A	OUT
10/3/2005	561-655-0995		9:38A	IN
10/3/2005	[redacted]	[redacted]	9:52A	OUT
10/3/2005	[redacted]	[redacted]	9:53A	IN
10/3/2005	[redacted]	[redacted]	9:55A	OUT
10/3/2005	561-655-7629	Jeffrey Epstein	9:57A	OUT
10/3/2005	[redacted]	[redacted]	11:21A	IN
10/3/2005	561-655-7626	Jeffrey Epstein	7:27P	OUT
10/4/2005	[redacted]	[redacted]	9:36A	OUT

10/4/2005	561-655-7626	Jeffrey Epstein	9:48A	OUT
10/4/2005	561-655-7626	Jeffrey Epstein	10:33A	OUT
10/4/2005	[redacted]	[redacted]	10:58A	OUT
10/4/2005	561-655-7626	Jeffrey Epstein	11:08A	IN
10/4/2005	[redacted]	[redacted]	11:15A	IN
10/4/2005	561-655-0995	Jeffrey Epstein	11:16A	OUT
10/4/2005	[redacted]	[redacted]	4:30P	OUT
10/4/2005	[redacted]	[redacted]	8:35P	OUT

EXHIBIT 2

— CONFIDENTIAL —

Visitors Massage (P.B)

[redacted]

[redacted]

2

[redacted]

[redacted]

- CONFIDENTIAL -

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[redacted] Cell.
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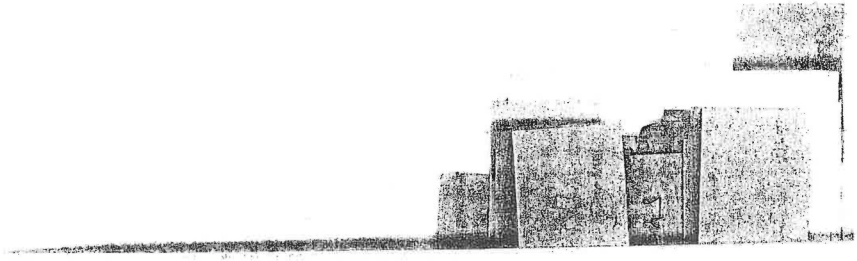
(212)755-7050 - Charley Palmer (Chef - Aureole Restaurant) NYC
(970)274-0323 - Joe Pagano (Chef - Aspen, CO,)
(Important Witness) - Christophe (French Driver) P.B [redacted]
→ (Jet Aviation)

→ Secret Service Personnel escorting Mr. Barak, Ehud Former P.M of Israel on J. Epstein planes.-

★ ★ ★ → Jean-Luc Brunel "Scout" for young females Karin Models [redacted]

- David Copperfield (Magician) [redacted]
- Eve Andersson (Former model & mother of naked pic (Dubin) [redacted]

- David Cook Palm Beach (2004-2005) Witness, interacted and chat daily w/ underage girls.-



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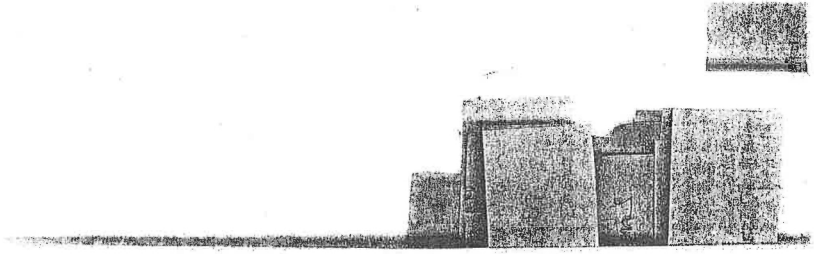

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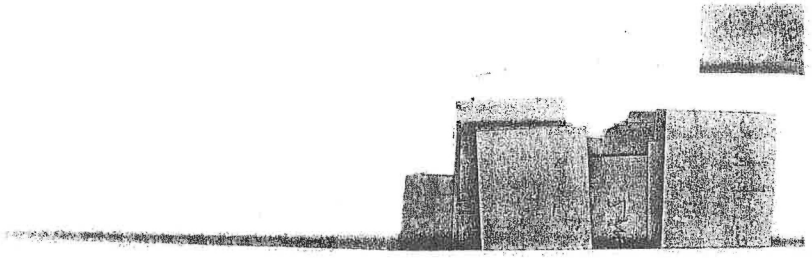

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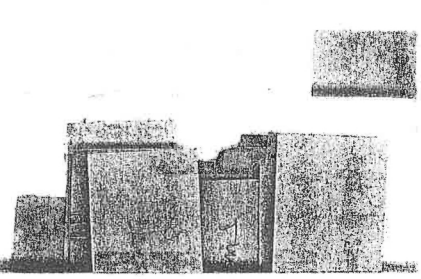

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212 348 9245 fax
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212 348 1779 Laura (Clinton's scheduler)
941 349 6467 doug.bands h
917 887 8468 Jim Kennedy(press)
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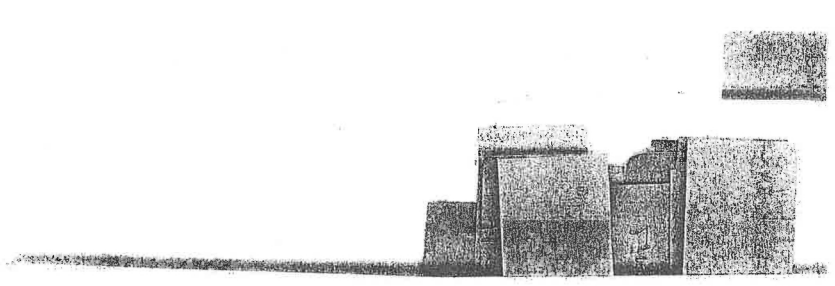

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0492 860584 (h)
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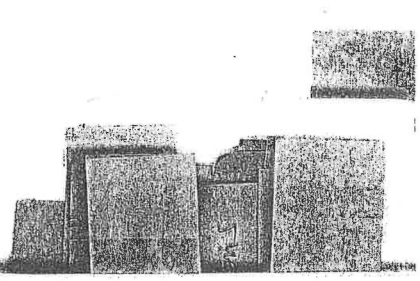

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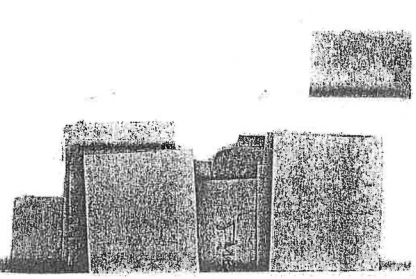

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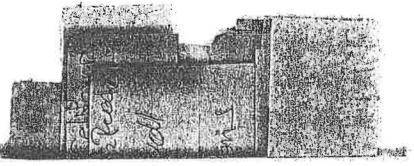

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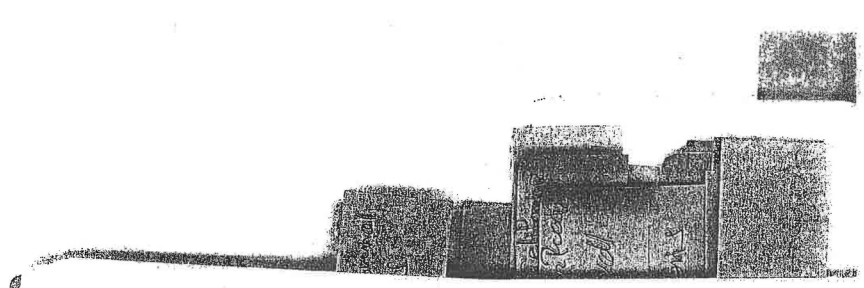

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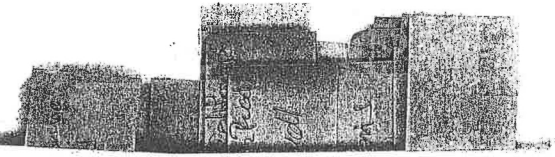

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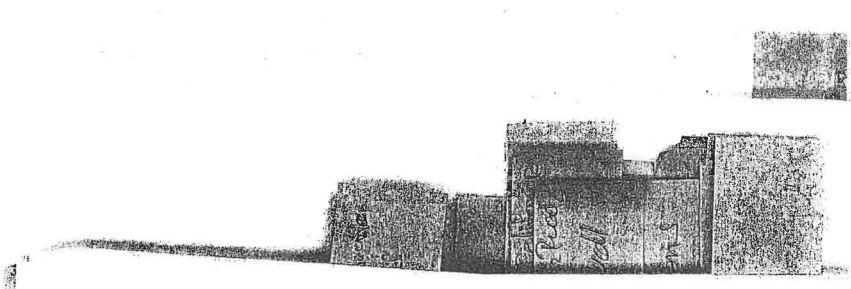

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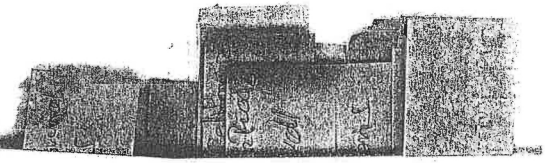

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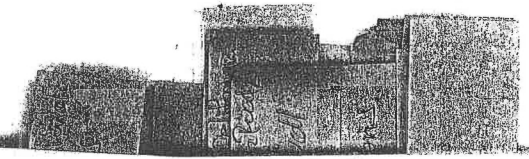

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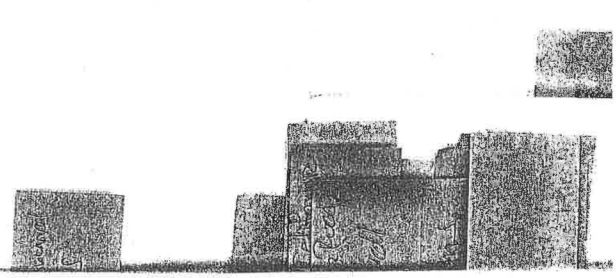

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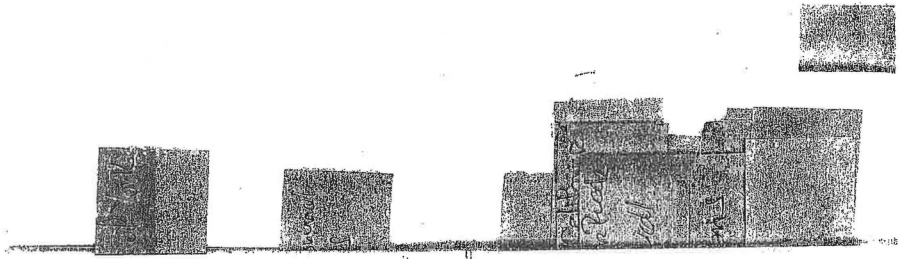

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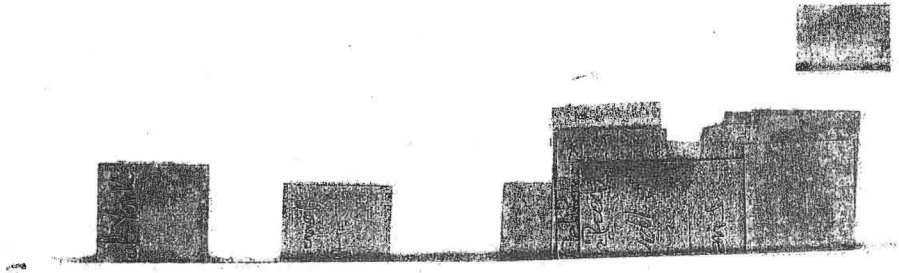

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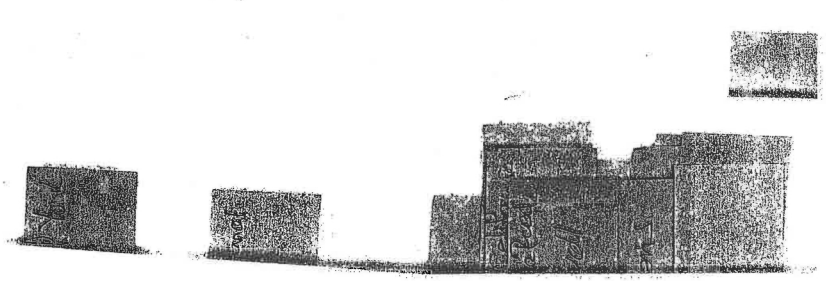

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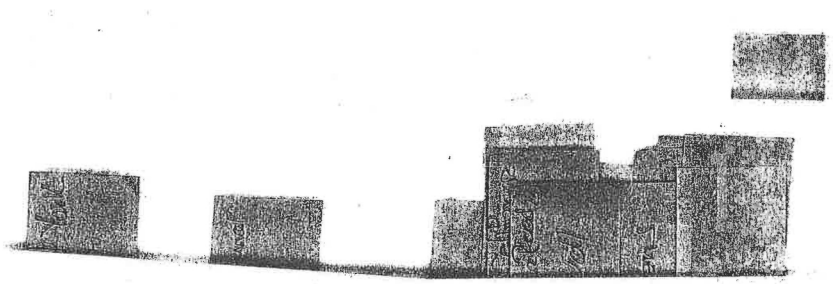

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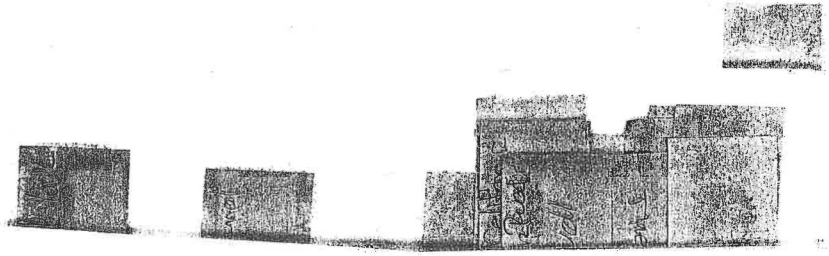

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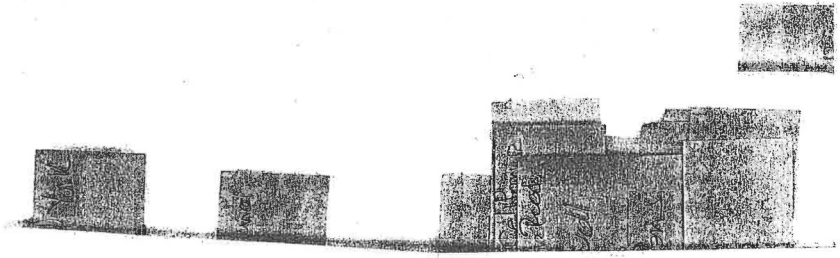

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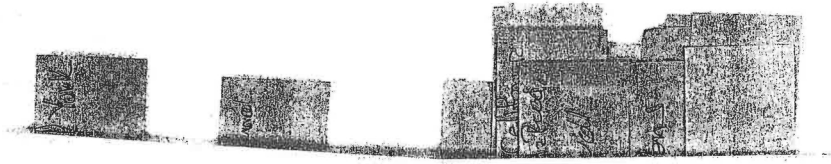

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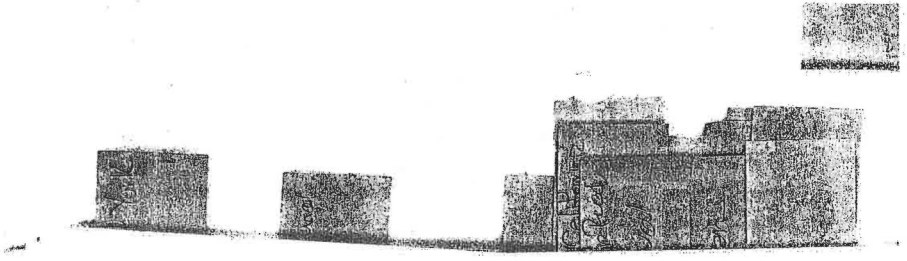

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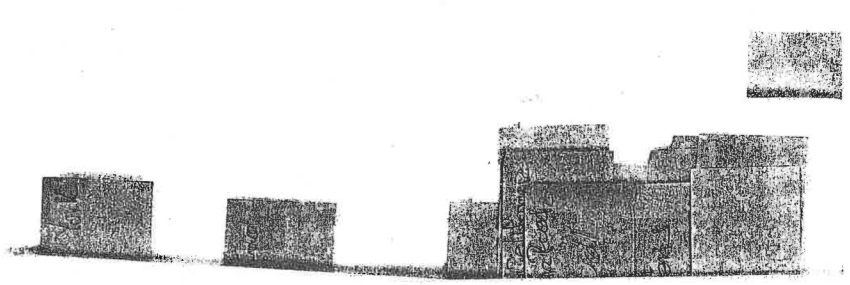

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07979 597899 Pandora (p)
001 646 435 5645 (w) NY
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07887 525855 Ade driver
0207 486 6300/4900 (w)

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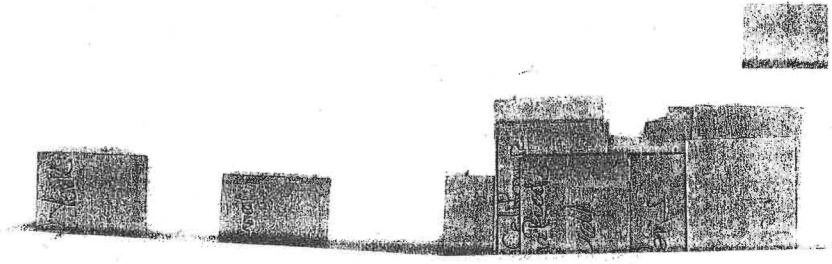

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0207- 486 9300 (wf)
01491 651 782 (h)
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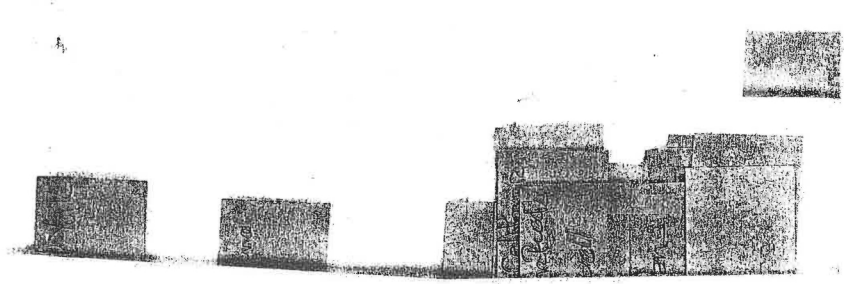

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Murray, Jean Pierre
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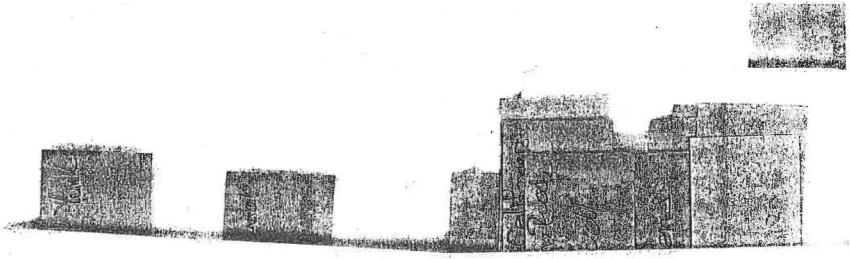

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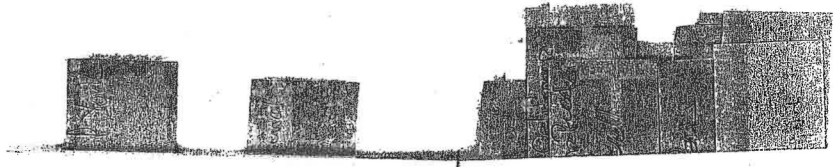

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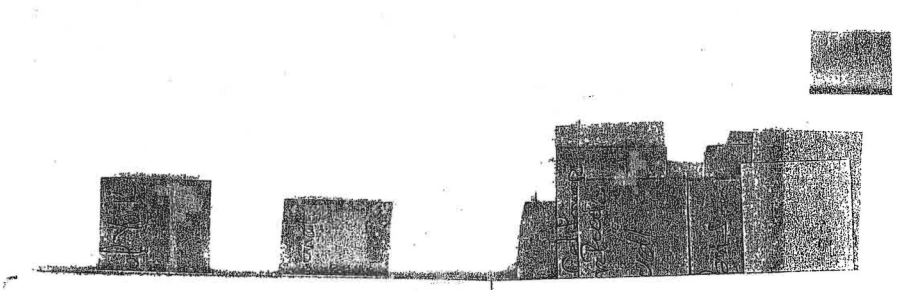

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001 212 799 9909 (w)
001 212 941 6336

Zevi, Dino & Rosi
8 Lennox Gdns
London SW1
0207-584 8661 (h)
0207-495 8867

Zilkha, Bettina
Apt. 16A
50 East 79th St.
New York
NY 10021
001 917 825 8761(p)
001 212 585 2011(h)
Email: Bettinalz@aol.com

Zipp, Brian
160 E. 72nd St. #3A, 10021(h)
01 212 879 8240 (h)
01 212 332 1113(w)
Email: bzipp@zippcaptial.com
0101 203 868 9787
portable 01 917 626 5800
0101 212 772 7057 Home Fax

65TH STREET

Dionne, Ryan
the chef
301 East 66th Street
#8c
New York, NY 10021
1 609 915 9311 (c)
1 212 535 7374 (h)
1 888 533 9632 (b)

Geffert, Scott
413 South Maple Ave.
Glen Rock NJ
07452
001 201 493 7647(h)
001 917 842 5755 (p)
Email: scott@cdiny.com

GIUFFRE00162

HOUSE_OVERSIGHT_014190

(Hm)PO Box 4495
Grand Central Station
NYC, NY
10163-4495,
201 493 7640 (h)
917 842 5754 Howie cell

Joseph & Florina Rueda
917 690 8794 (Jp)
917 499 7936 (Fp)
301 793 1695 (Fp)

Kellen, Sarah
301 East 66th Street
Apt 10H
New York, N.Y. 10021
917 855 3363 (p)
212 517 7580 (h)
Email:
sarahlynnelle@hotmail.com

Kelly, Brian
67 Kayuga Rd.
Putnam Valley
NY 10579
845 526 3716, (h,f)
914 804 6719(p)

Maxwell, Ghislaine
116 East 65th St
New York, NY 10021
Email: gmax1@mindspring.com
212 737 0335 Voicemail (Password 5366831)
212 879 8204 (wf)
212 879 2670 JE Line 3

212 879 8013 Guest Modem
371432863 Resale Number
212 202 4941 New E-fax
1 800 336 4685 AT&T World Connect
917 690 8794 Joseph (p)
917 499 7936 Florina (p)
800 335 4685 World connect chip SIM
917 642 5755 Scott cell
201 493 7647 Scott (h)
866 782 3274 Scott (w/Howie)
916 843 4685 AT&T World Connect(outside US)
212 879 9366 GM Line 1
212 879 2058 GM Line 2
212 879 9459 (bf)
212 535 7871 JE Line 2
212 535 5612 JE Line 1
212 535 6831 Guest
212 472 6991 Staff
212 535 3030 (w) Line 1
212 535 6833 (w) Line 2
212 535 4384 (w) Line 3
212 535 5611 (w) Line 4
212 535 6837 Spare office
212 249 8510 71st St
212 717 4672 71st St (f)
917 520 3106 (p)try first
917 497 4880 (p)
01144 7785 771552 GSM#
917 494 9690 Tahoe-Line 1(621)
917 855 6931 Tahoe-Line 2
561 346 7141 PB Merc.
1 877 359 9350 Flight Options
212 744 5511 Tahoe Garage
1 888 387 4383 Ellrieve
959084 Ellrieve Mailbox#
9366 Ellrieve security code
212 535 8817 Rich's Security

Mitrovich, Andrea
Ballerina
153 West 75th St #4B
NYC, NY 10023
917 957 5341p
Email: andrea_mitrovich@yahoo.co

Police
Serg - RObert Goldberg
19th Precinct
917 363 3879
212 452 0600,

Rueda, Joseph & Florena
116 East 65th Street
New York, NY 10021
Joseph 917 690 8794
Florina 917 499 7936

Tahoe, Kinney Garage
301 East 66th
212 744 5511(George)

AMERICA(A)

Antiques - Resale Number
13-3647756

Arizona
206 East 60th Street
001 212 838 0440

Aspen Club
303-925-8900

Au Bar
58th Street
Between Madison & Park

Avis International
800-331-2112

Bel Air Hotel
General Manager
Frank Bowling
701 Stone Canyon Road
Los Angeles, CA 90077
310-472-1211
310-476-5890
310 472 1211 Reservations
Manager Marc

Beverly Hills Hotel
9641 Sunset Blvd.
Beverly Hills, CA 90210
310-276-2251
310-271-0319
310 887 2887 fax

GIUFFRE001(

HOUSE_OVERSIGHT_014191

Beverly Wilshire
001 310 275 5200

Bice
54th (Madison/Fifth)
001 212 688 1999

Bilboquet
0101 212 751 3036

Bond Street
6 Bond St
777 2500

Carlyle
35 E. 76th Street
001 212 744 1600

Christies- New York
GM's Acct# 2074367
JE's Acct# 20745
20 Rockefeller Plaza
New York, NY 10020
001 212 636 2000 (f)
212 636 2010
212 546 1036 Michael
212-636-2511 Sharon Kim
212 546 1002 Natasha
0207-389 2865 (bidno)
212 546 1122 Patrick Cooney
0207-591 7611 S. Ken
0207-839 8060 St. James
0370 917 323 (p)Franka Mercati
0207-589 4181 (h)Franka
212 546 1195 Carol Magill
212 636 2515 Maria Loss - Client Services
212 702 2627 Kim Solow
212 636 2389 Sarah Charnon

Cipriani Downtown
376 West Broadway
New York, NY 10012
212 343 0999

Coffee Shop
162 Union West
162 Union West

Cohen Gibby
Polly Gym
428 East 75th Street (bet 1st
176 E. 71st St Penthouse
001 212 570 0816(h)
Email: Gibby-Cohen@nyc.rr.com
(Hm)Patti-Cohen@nyc.rr.com
001 212 628 6969(gym)

Cook
Henry Meer
001 212 924 6160(h)
0101 212 677 4100

Dawat Haute Cuisine of India
210 East 58th Street
New York
0101 212 355 7555

Delmonico's
Rosa/account under NYSG
320 Park Avenue
New York, NY 10022
212-317-8777

Doyle's
175 East 87th
001 212 427 2730

Elaine
577 Second Avenue #61
NY, NY
001 212 779 9645

Electrolysis
988 1215

Elio's Restaurent
2nd avenue between 84th and 85
212 772 2242

Essex House
160 Central Park South
New York, New York 10019
212-247-0300

Estia
308 E 86th
NY, NY
628 9100

Exercise-New York
1 212 228 2655 (h) Kristin Mcgee
1 646 498 8095 (p) Kristin Mcgee
1 212 995 1127 (h) Magali
1 917 553 0136 (p) Magali
646 338 4491 Jessica Benton(p)
212 737 5947 Jessica Benton(h)
781 820 6694 Jennifer(ballerina)

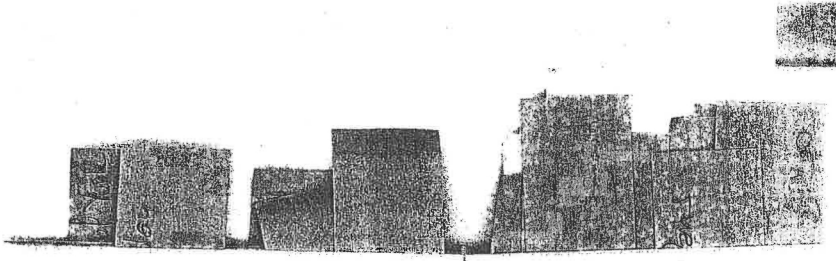
Four Seasons
212-758-5700

Four Seasons Hotel
57 East 57th Street
212 758 5700

Four Seasons Restaurant
99 E. 52nd (Park/Lex.)
New York, NY 10022
212-754-9494
212-754-1077

GIUFFRE00163

HOUSE_OVERSIGHT_014192



London
SW1X 7PA

Myers of Westwick
Pork Pies, Pork Sausages
634 Hudson Street
New York, NY
212 691-4194

Nicolas
001 212 249 9850

Opia
antoine Blech
917 751 4551
212 688 3939

Peninsula Hotel
mathew bartle (mgr)
9882 South Santa Monica Blvd
Beverly Hills
Los Angeles, CA 90212
310 551 2888
310 788 2319 (f)

Peninsulla Hotel
700 Fifth Avenue
New York, NY 10019
212-247-2200
212-903-3949

Pierre Hotel
2 East 61st Street
New York, NY 10021
212-838-8000

Plaza
001 212 759 3000

Plaza Athenee Hotel

Trust House 40
37 East 64th Street
New York, NY 10021
212-734-9100

Province Restaurant
between Mcdougal & Prince

Ritz Carlton
001 212 757 1900

Royalton
44 West 44th St.
(between 5th & 6th)
212-869-4400

Sette Mezzo

969 Lexington
New York

0101 212 472 0400

Shoes-Repair
Shoe Service Plus
15 West 55th Street
001 212 262 4823

Shutters on the Beach
1 Pico Blvd.
Santa Monica, CA 90405
310 458 0030 (t)
310 458 4589 (f)
800-334-9000

Sotheby's
JE Acct# 3011 4352
GM Acct# 3062 4014
1334 York Ave
NY, NY 10021
001 212 606 7000
0207-493 8080
(Him)34-35 New Bond Street
London
W1A 2AA
001 212 606 7423 Sully
001 212 606 7683 Sotheby's Realestate-Meredith
0207 293 5000 UK
212 431 2424 Real Estate-Steve Mcguire

St Regis Hotel
2 East 55th St
betn 5th/Mad
New York, NY 10022
001 212 753 4500

Stanhope Hotel
212 774 1234

Sunset Marquee
0101 213 657 1333

Tao Restaurant
42 E. 58th Street
bet. Madison/Park
001 212 888 2288

Taylor, The
300 East 62nd Street
001 212 535 8940

The Great American Health Bar

35 West 57th Street
New York
0101 212 355 5177

The Lowell
0101 212 838 1400

The Westbury
0101 212 535 2000

GIUFFRE00163

HOUSE_OVERSIGHT_014193

Tickets
For shows and games
212-643-1274 Premiere Tickets
212 590 2531 NYC Concierge/Johanna London

Tribeca Grill
001 212 941 3900

Two Bunch Palm
0101 619 329 8791

Waldorf Astoria
0101 212 355 3000

Westbury hotel
212 535 2000

BRAZIL

Cecilia Szajman
55 11 30 34 3771 (h)
55 11 55 06 9553 (f)

Ganero, Mario Sr.
Brasilinvest
Av. Brigadeiro Faria Lima,1485
Torre Norte - 19 Andar
Sao Paulo, Brazil
CEP 01451-904.
01155113813.7011(w)
01155113813.7110 (f)
Email:
mgarnero@brasilinvest.com
0133493781330 house in France
01133621051972 cell in France

Riccardo
#1 Polo player
00 55 11 9937 8888

ENTERTAINMENT (E)

Annabels
071-629 1096

Aspinals
071-629 4400

Bibendum
581 5817

Clermont Club
071-493 5587

Daphne
589 4257

Foxtrot Oscar
352 7179

Harrys Bar
408 0844
408 0844

Marks Club
212-499-2936

Nam long
373 1926

Nikitas
352 63 26

Patisserie Valerie
0207-823 9971

San Lorezo
584 1074

Scalinis
225 23 01

Tramp
071-734 3174

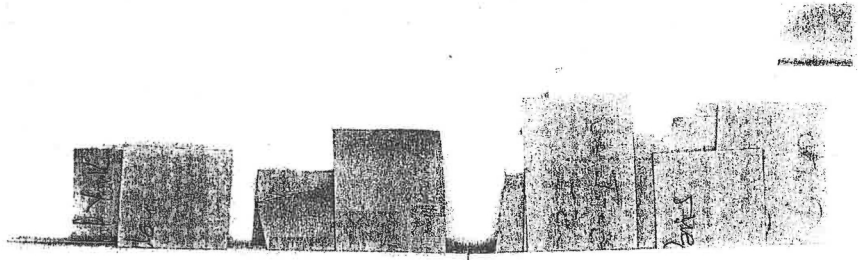
FINANCE (F)

Bear Stearns
Ira Zicherman
245 Park Avenue
New York, NY 10167
001 212 272 4189
acct # 042 33431

Centurion
1977 877 0987
3715 659 404 44006 Card number
10/04 Expiry date

Chemical Bank
Vice President
James A. Growney
Madison Ave. & 52nd St.
New York, NY
212-935-3935
212-688-8355
Barbara Parsley Wire Dept.
425-0800 Sel-Bus
090-44-3348 Select/800-821-2088
Stop payment no. 935-9935
212-980-6573

GIUFFRE001641
HOUSE_OVERSIGHT_014194



Colonial Bank
Cristina Bello
125 Worth Avenue
Palm Beach, Fl 33480
561 627 1776 (w)
561 833 0943 (f)
Léonor

Nat West
Rob Bowran (Sharon Mulvany)
Personal Accts. Executive Dept
121 High Street
Oxford, OX14YU
01865 79 0053
01865 20 5157 (f)
Email: www.natwest.com
(Hm)32 Commarket Street OX1 3HG
08201994 Current Account
01865 79 88 18 Main number

Natwest Bank
1865 790053
1865 205157 (f)

PB National
Dottie Wilson
ck acct # 0110056698
mm acct# 0110019334
001 561 653 5352

FRANCE (FR)

Alaia, Azzedine
7 Rue De Moussy
Paris, France 75004
00 33 1 4272 1919

ATT Acess
0 800 99 0011,

Bristol Hotel
112 Rue du Faubourg St. Honore
75008 Paris, France
011 33 153 43 43 00
53 43 43 01(f)
Email: clientservices@hotel-bris
331 698 99475 Jean marie home
33(0)611999322 Jeanmarie port

Cab Blue
4936 1010

Cabaret (night club)
Contact Frank
68 rue Pierre Charnet

Car rental
Avis/St Tropez
Mr. Baccarli
00 33 04 93 21 48 90

Chateau de la Messardier
011 33 4945 676000

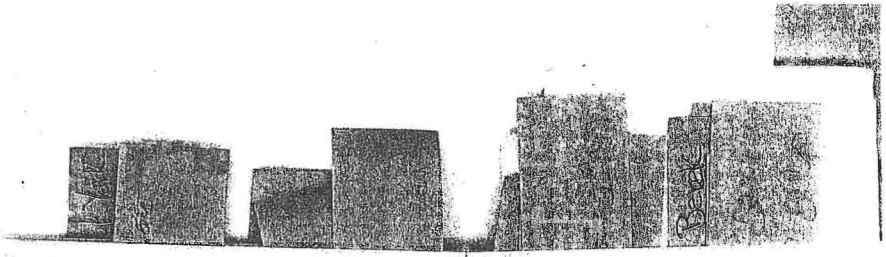
Chez Denise
00 33 1 4236 2182

Chez L'Ami Louis
32, Rue du Vert-Bois
Paris, France 75003
33 1 48 87 77 48
Ferme Lundi & Mardi

Epstein, Jeffrey
French Apartment
22 Avenue Foch
Apartment 2DQ
Paris, France 75116
331 441 70210
331 441 70211(f)
(Hm)1 Rue Chalgrine/Staff Entrance
BA135
B298
01 47 37 18 18 Ambasador Car Co.
0153 43 4300 Jean Marie (w)
01 698 99475 Jean Marie (h)
06 11 999 322 Jean Marie (p)
061 30 14 377 (p) Valdson Cotrin
0 148 27 85 33 (h) Valdson Cotrin
01 40 67 18 82 staff line
01 45 00 44 78 Mr. Cornu/garage
06 77 81 5521 car phone
06 8072 7282 Evelyn
06 10786479 Mr. Coulaux(p)
0607 269 785 Experton(p)
0144 014 401 Experton (w)
331 441 702 19 guest line
331 44 86 4552 Ms. Guerin
01 45 00 88 90 Ms. Peres(conc.)
01 45 00 30 79 Ms. Peres
06 09 592 653 Ms. Peres (p)
331 44 01 4401 Mr. Stephane Coulaux
06 12 14 37 56 Mr Santos

Epstein, Jeffrey (G)
French Apartment
22 Avenue Foch
Apartment 2DQ
Paris, France 75116
331 441 70210
331 441 70211(f)
Email:
epstein@wanadoo.fr(Valds
(Hm)1 Rue Chalgrine/Staff Entrance
BA135
B298
01 47 37 18 18 Ambasador Car Co.
01 53 43 43 00 Jean Marie @ Bristol
01 698 99 475 Jean Marie @ home
06 11999322 Jean Marie cell
01133 61 30 14 377 (p) Valdson Cotrin
01133 148 27 85 33 (h) Valdson Cotrin
01 40 67 18 82 staff line
01 45 00 44 78 Mr. Cornu/garage
06 77 81 5521 car phone
Evelyn 0680 727282
331 441 702 19 guest line
01 45 00 88 90 Ms. Peres(conc.)
01 45 00 30 79 Ms. Peres
06 09 592 653 Ms. Peres (p)
01 45 27 85 05 Ms. Roula/Kitchen appliances
01 42 84 50 21 Mr. Pascal(cable tv)
06 62 31 88 55 Mr Pascal cell(cable tv)
01 43 87 49 30 Mr Karim or Lazno (stereo)

GIUFFREE00164
HOUSE_OVERSIGHT_014195



06 09 65 65 55 Mr. Karin or Lazno cell(stereo)
01 48 71 23 23 Mr. Tourteau(videophone)
06 62 96 04 67 Mr. Tourteau cell(videophone)
01 40 60 93 93 Mr. Belistan(alarm)
06 09 21 15 15 Mr. Belsten cell (alarm)
01 42 71 99 93 Mr. Domenichini(electricity)
06 07 34 50 84 Mr. Domenichini cell (electric
01 42 39 11 90 Mr.Lafond(a/c, heat, plumbing)
06 07 80 25 61 Mr. Lafond cell(a/c,heat,plumb
06 08 03 42 71 Mr. Pasquer cell(a/c,heat,plum
06 12 14 37 58 Mr Santos

Experton, Marie Joseph
Berlioz & Co.
Avenue Louise 113
1050 Brussels
011 32 25 38 22 34
011 32 2538 22 46FAX
Email: mjexperton@skynet.be
011 32 474 55 0073 Belgian Cellular
011 33 607 26 9785 French Cellular
01133144014401 Berlioz France(w)
01133144159415 Berlioz France Fax

Gerard
33 (0) 609 515 909

Hotel Crillon
10 Place de la Concorde
Paris, France 75008
331 44 71 1500

Hotel Raffael
4428 0028

Junot, Philippe
509 Madison Avenue
New York, NY
212 223 7167 (w)
212 223 3463 (wf)
Email: plunot@sisgroup.com
(Hm)15 avenue Malignon
75008 Paris
France
+33 145 042611 Paris
+33 616 80 6000 (p)
+34 952 77 8425 (Spain)
+34 95 277 0294 (Spain fax)
+34 699 212 296 (Spain p)
917 250 6416 (p)
212 223 7167
011 44 370272428 portable
212 223 3463 New York f

L'Amijean
Rue de Varene
7eme
Rue de Varene

L'Arc
Rue Puisite
33 1 4500 4500

6eme

L'Arpege
00 33 1 4551 4733

La Merlot
Rue de la cherche midi

La Poste
00 33 1 4280 6616
9 rue Peronaid

Lagardere, Betty
34 Rue Barbet de Jouy
75007 Paris
01 40 69 17 25
06 85 755 555
06 85 754 444
01 53 593 575
01 53 593 574 (f)

Lawyers
01 4401 4401 Stephane Coulaux (w)
06 1078 6479 Stephane Coulaux (p)
01 4401 4401 Geraldine Talavera (w)

Le Telegraphe
00 33 14015 0665
Rue Lille

Le Voltaire

Madame Lemercier
00 33 1 4329 44b5 (4)
00 33E 160460293 (h)

Maid
01 48 49 07 50 Faiza (Jeanmarie's Burlet's)
06 16 79 25 49 Faiza's cell
01 45 39 28 93 Anne-France

Massage - Paris
Claudia Hadida 0494791726(St T
331 4262 3091 Debbie/ Paris
331 4299 8800 Marie Francois
331 4763 3301 Rosemary
336 8280 5320 Alexandria
336 7043 8359 Caroline
336 7043 8359 Caroline
336 1409 3317 Debra Wakshal
336 0740 4991 Isabelle
336 6091 5535 Stephan(better than Gyoav)
331 4244 5033 Bastien-foot massage
33142266 2422 Bastien-foot massage
334 9487 2631 Deborah
336 6063 3127 Francois
336 1117 5286 Suzanne(Nicole's contact)
336 6098 3802 Corine-thai (Nicole's contact)
336 6261 7962 Karine (Nicole's

GIUFFRE001642
HOUSE_OVERSIGHT_014196

contact)
3314766 3727 Karine (Nicole's contact)
336 8520 0065 Deborah (p)
0661100404 (p) Laetitia
0682940794 Magdali
336 606 33172 Francois
011 336 6760 8207 Donna
011 331 4658 1508 Donna
011 336 1109 9059 Yelena
011336096351 80 Nadia
06 2247 4450 Deborah
0609635180 Nadia
0662384798 Sonya (speak little English)
0666603635 Tanya (speaks NO English)
011336240414 1 Nadia (USE THIS as of 4-9-03)

Miele, Mr & Mrs
00 33 9301 3359 (h)
00 33 9306 1179 (c)
00 33 9306 1273 (c)
00 33 9301 2196 (fax)

Ott Cynthia and Claude
22 Avenue Foch, Apt 2DD
Paris, France 75116
011 331 4502 7300(h)
011 33674 003080 (cp
Email: 011 33 986 558377 (claude
01133 153 05 70 83 (w)direct
01133 153 05 70 98 (f)

Pinto, Alberto
Hotel de la Victoire (w)
11 Rue d'Aboukir

75002
Paris, FRANCE
011 331 401 30000(w)
011 331 4418 7575(h)
Email: alberto.pinto@albertopint
(f-m)Alberto Pinto (it)
81 Quai D'Orsay
1st Floor
Paris, France 75007
011 331 4753 8421 (h) Linda
001 809 362 4336 Nassau
001 809 362 4336 Nassau
011 331 4013 7580 (f)
011 33 60 770 2913 (p) Linda
011 33 6077 31338 (p)Alberto
011331 45 51 03 33 Serge Boquet
011336 07 17 07 24 Serge Boquet 3/2000
011 33 67 600 4392 (p)Serge
011 33 680010222 Car
011 33 140 137 596 Linda dir.
011 331 401 37642 Linda & Alberto pvt fax
alberto.pinto@albertopinto.com
linda.pinto@albertopinto
serge.boquet@albertopinto
delphine.rateau@albertopinto
jean.huguen@albertopinto
011331 45 51 45 58 Danielle
01133 609 18 11 26 (p) Jean
01133 609 78 66 26 Yves
01133 662 62 71 36 Chantal
pascal.janarra@albertopinto
+33 144 197 575 Paris h
01121239933939 Pinto in Morrocco
011 212 39 93 7171 Morrocco fax
+33 144 1875 71 (hf)
+33 140 13 0000 (w)
+33 140 1375 98 Direct
011336805988 76 Nissan' s cell
infographie.pinto@albertopinto

Plaza Athenee - Paris
25 Avenue Montaigne
Paris, France 75008
33 1536 766 65
33 1536 766 66 (f)

Restaurant-takeouts
Sushi 01 58 26 00 55

Restaurants
Entrecote
15 rue Marbeauf
0149520717

Ritz - Paris
15, Place Vendome Cedex 01
Paris, France 75041
331-4316-3030
331-4316-3178(f)
331-4286-0091 Direct Fax Reservations

River Cafe
00 33 1 4093 5020
146 quai de Stalin grad

Tante Louise
41 Rue Boissy d'anglais
00 331 4265 0685

Taxi Bleus
01 49 36 10 10

Taxis
00 331 420 24202
00 331 49 361010
00 331 420 39999
00 331 420 06789

Taxis Bleus
0149 36 10 10

Vieira Cotrin, Valdson
21 Rue Voltaire
Paris
St. Dennis
Paris, 93200
014827 8533 (h)
06130 14377 (Hm)1 Rue Chalgrin (Ave.Foch Apt)
Room 4041 Floor 6
Paris France
0613 011 763 Maria (p) girlfriend
0144 778 840 Maria (w)

HOTELS (HT)

Berkeley Hotel
0207 235 6000

GIUFFRE00164

HOUSE_OVERSIGHT_014197

Blakes
071-370 6701

Carlton Tower
071-235 5411

Claridges
Brook Street
Mayfair, London W1A 2JQ
44 207 629 8860
44 207 499 2210 (f)

Cliveden House
London
01144171730646 6
062-866-8561

Connaught
071-499 7070

Dorchester
071-629 8888

Lanesborough Hotel
General Manager
Geoffrey Gelardi
1 Lanesborough Place
Hyde Park Corner, LONDON
SW1A 7JA UK
44 207 259 5599
44 207 259 5606 (f)

4471-333-7633 Private fax. 8/2

Ritz
071 493 8181

Savoy
071-836 4343

The Barcley Hotel
London
0207-235-6000

Waterside Inn
0628 20691

ISLAND(I)

Air Center Helicopter
340-775-7335 Nicholas & Tina (o)
340-774-0976 home
340-690-1012/11 cell

Christopher Taxi
340-690-1581 (cell)
340-777-5092 (home)

Cox, Madison
Madison Cox Design, Inc.
220 West 19th Street
9th Floor
New York, NY 10011
212 242 4631(w)
212 807 8081(f)
Email: mc@madisoncox.com
917 495 9399 (c)
011212635263 82 Moroco p

Epstein, Jeffrey
LSJ
6100 Red Hook Quarters B-3
St. Thomas, USVI 00802
340 774 1611 staff 1
340 777 9181Offic(f)
Email: calhmile@yahoo.com
(Hmmanager@littlestjeff.com
340 774 1611 staff 1
340 775 7335 Air Center Helicopter
340 690 1012 Nicolas (p)
340 777 5334 Gretchen(h)
340 774 0056 JE 1
340 714 0805 JE 2
340 714 0806 JE 3
340 774 3578 JE 4
340 771 2680 JE (p)
340 777 4414 JE Study (f)
340 714 2552 GM
340 771 2679 GM (p)
340 771 2024 Miles (p)
340 771 4897 Cathy (p)
340 714 0807 Staff 2
340 771 1523 Cell Backup 1
340 771 3828 Cell Backup 2
340 771 2032 Boscoe Hague(p)
340 777 0669 Boscoe (b)
340 771 1339 Bruce White(p)
340 771 6264 Tim Cook
340 776 6454 Amer. Yacht Harb.
340 776 5970 Amer. Yacht Harb.(f)
340 774 4265 Cottage(f)
340 771 2678 Guest (p)
340 714 0808 Spare (unused)

Epstein, Jeffrey
Financial Trust Company
6100 Red Hook Quarter
Suite B-3
St. Thomas, USVI 00802
340 775 2525
340 775 2526 (f)
340 775 6093 Leon (h)
340 690 0241 Leon (p)
340 690 3623 Leon (b)
340 775 6971 Dale (h)
340 777 6157 Cecile (h)
340 775 6285 Jeanne (h)
340 775 2770 Lorette (h)
340 774 9599 Jermaine (h)
340 776 1351 Jamie (h)
340 775 6057 Daphne (h)
340 714 3955 Kim (h)
340 690 1443 Cecile portable
340 771 6086 Leon car

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340-774-2030 (f)
617 547 7907 Boston h

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340 774 3318 (h)
340 776 8309 (hf)

Massage A - Island
340-693-9040 Grapevine Salon (Lynn & Karen)
340-693-8378 Lynn & Karen Gray (h)
340-776-2414 Muffie Landt
340-777-7049 Zeno (h)
340-626-2913 Zeno (p)
340-693-7817 Kevin Raynold
340 693 9040w Gretchen Rhodes
340 777 5334 Gretchen Rhodes home
310 435 4725 Gretchen's cell

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212 989 1781 xt 34 Fiona's direct line
917 650 8429 (p)
212 989 1781x27 Jennifer

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340-775-6501

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Jerusulam, Israel
00-972-50-997-755(p)
00-972-23692-2020(o)
00-972-23692-2032f
0097 23 691 6271 (w)
0097 23 691 8630 (f)
0097 22 283 697 (h)
001 212 977 4000
001 917 817 6832 (p)

Olmert, Ehud
00 97 2 6296014(f)
00 97 2 2 6297997
00972 (2)229 6014

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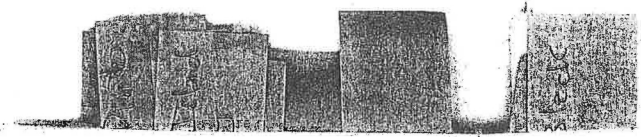
Torne di Pisa
Via Mercato 26
87 48 77

Train Info
010 39 2 80231

JEFFREY (J)

301 East 66th St.
Front Desk
301 East 66th Street
New York, NY 10021
Apt for Models

GIUFFRE00164
HOUSE_OVERSIGHT_014199



212 879 5540
917 857 4546 And.pgr
917 545 6300 Guest cell
212 744 3122 8D
917 242 0111pager Yokosta Caba - cleaning lady
718 466 0373 (h) Yokosta Caba
212 472 4606 2G (Morrison)
212 472 4420 2G (fax)
212 988 8164 3F - (Anna Macedo/Guest)
212 628 3213 3F - (Guest)
212 861 9072 4M (guest)
917 432 1502 4M (not used)
212 585 3170 5P (L&J)
212 628 3931 7J (ans/fax)
212 628 3952 7J - (Jean-Luc/Guest)
212 517 7580 8A (Brent)
212 452 1565 8C (guest)
212 249 4958 10N (Sarah)
212 249 5755 10N (Sarah)
212 517 7779 10B (Dave)
212 737 7975 11P - (guest)
212 737 9538 12C (Larry V)
212 737-9536 12C (f)
212 517 5380 14G - (guest)
917 603 2296 Natty

212 318 3201 (w)
516 287 3553 (h)
516 287 2921 (Cath.)
212 318 3400 (wf)
203-629-5216 (Conn. h)
203-629-5218 (f)
212-888-1520 (h)
212-935-1990 (hf)

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212 242 5782 (h)
347 256 7078 (p)
212 334 7480 (w)

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631 283 5282 Hamptons
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646 271 1304 Lulu
917 613 0291 Lulu (p)
914 669 8157 NS fax
44 777 159 6557
914 669 8157 North Salem f
011 46 5227 0397 Parents (winter)

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614 746 1445 car
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614-895-2733 Home Fax
614 415 7186 Sherry Castle
614 939 3070 emergency
614 415 7171 (wf)

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212 754 4432
212 758 5700 work(1-9-03)

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011 3933 5765 1775 Tracey
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718 268 7331 (f)
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212 288 3579 Donna Landa - home
718 575 1000 Ossa Prop
908 249 3633 x224 Donna Landa - work
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401 423 0495 Parents/ Rhode Island
310 463 5759 (p)
310 553 5218 (h)

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212 922 5717(f)
212 922 5543 Bob Crowley

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(new name)
Signature Flight Support

Hanger 15
Newark International Airport
Newark, NJ 07114
201-624-1660

Campos, Michelle
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Rivard Soty.

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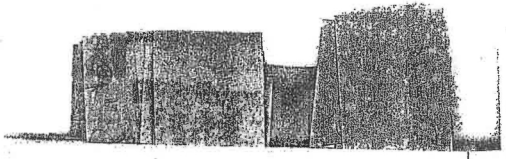

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+852 2370 1305 (wf HK)
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917 353 6522 (p)
917 602 1261 driver
212 548 1388 (w)
212 548 1391 other
212 548 1350 (wf)
0777 464 2756 emergency -
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559 6083 Geoff VonKuhn

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212 573 6885 NY Apartment
617 661 0351 Carolyn Cohen (h)
617 576 1353 (hf)
617 974 7013 (car)
617 881 1965 (h)'First*
0000000000000000 (p)
212 573 6885 NEW NY # (12-7-01)

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646 541 1751 Timeport
319-540-2265 Gulfstream
N909JE (air)
319-540-2265 Gulfstream
N909JE (ground)
319 540 2558 (air)727 N908JE
319 540 8558 (ground)727
N908JE
851 796 5194 (satel-
lite/emerencies) N909JE
917 497 4860 spare 727 p
011 881 6314 54353 satellite -
GM
011 881 6314 54123 satellite -
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917 545 6300 Guest cell

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917 400 1315 Yuni (p)
718 263 7182 Yuni (h)
203 762 2539 Eric (h)
203 984 6064 Eric (car)
516 791 3744 Jeff S (h)
516 578 7868 Jeff (p)
212 988 9505 Darren (h)
646 246 8434 Darren (p)
212 831 3253 Lauren (h)
917 496 6126 Lauren (p)
212 758 0256 Cimberly (h)
212 486 6609 Lesley (h)
973 650 8447 Lesley (p)
718 230 1767 Helen (h)
212 935 3961 Front Desk
212 935 3960 457 Mad. Switchboard
212 319 8113 Dictaphone
718 787 0327 Al Castricone-457 Manager(h)
917 217 6583 Al Castricone (p)

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616 276 7294(f)
616 276 5296 2nd line

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212- 368-5439 (home)
212-645-6656FAX

212-645-2620 (Work do not try)
212-244-5484 King Graphic Tech., Inc.
917-543-2432 Portable
511 WEST 33 1ST FL King Address
212-229-2057 Mark's assistant-Amanda
212 366 5439 Mark's direct work #
212-645-2517 FAX

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Acct #1814-2081-6 JEC
Acct #1814-9779-3 JEE
Acct #1814-9809-9 Zorro
Acct # 2587-7622-4 Max Hotel
New York, NY
800-238-5355
800-654-0920 Automatic Pick-up
800-247-4747 International
212-777-6500 Local Office
800-654-0920 Problems/package trace
011 33 1 40 85 39 Paris local
011 27 11 82 35 10 Johannesburg

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212 645 6395 (h)
011 336 10523 815(p)
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718 893 6700 Brother - Victor
941 383 5228 Vacation
203 762 3155 (f)
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1 505 982 0565 (wf)
1 505 989 6781 (h)
1 505 699 3845 (p)
970 925 4135 (h)
970 920 1167 (hf)
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614-440-8127 (p)
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614-479-7220 Secretary
614-370-7222 (p)
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212-541-7403 Private Line
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212 685 3840 Michelle (w)
646 221 7715 Michelle (p)
570 722 3047 Pennsylvania
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973 597 1165 New House
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973 439 7222 DKI Graphics

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614 325 9978(p)
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340-690-23112309 Guyana
212 593 3098 (h)
914-967-7220 Westchester
212 984 1440 (w)
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917 974 8076 (p)
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212 984 1440 Emergency
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917 733 5757 ERJ's portable

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202 494 4945 Private line
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617 441 8111 hf
617 441 8111 (hf)
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617 953 8156 other
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425 936 7329 Corporate Fax Line
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425 467 2350 (wf)
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011 881631 425 172 Boat
866 501 9015 Plane
425 260 7319 Claudia - emergency

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271-0945 # Pin Number
410-879-8940 h&f-MD
614-479-7194 Bill Archer
410-440-2226 Mobil Phone-MD
614-329-0251 Mobile Phone-Col
614-899-2742 Home Westerville
614-479-7080 Ohio fax
614-478-9023 Home-Col
614-939-3070 24 hr number
614-479-7186 Sherry Castle's Direct Phone
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410 494 1163 Fax MD
443 831 2818 (p)
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800-411-3112 Ovitz's pager
310-476-8436 home
310-251-9971 LA cell
310-457-1592 beach
970-923-5750 Aspen
011-954-536-0455 boat ph
011-33609-062---975 boat ph
011-874761-569-147 boat ph
212 262 9340 NY answer.
310 476 5876 (hf)
310 713 3009 Cell as of 1-13-03

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212 348 5668 (h)
917 207 3901 Anne (Lisa's friend)
212 620 4244 Anne Fisher (Lisa's friend)
732 804 2603 Meredith
917 597 7132 Anna (Lisa's friend)
917 579 4050 Genaveve (Lisa's friend)
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703 419 8440 Washinton-Signature Fl. Supp.
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C.HX

201 288 1880 International Aviation
970 920 2016 Aspen Base Operations
310 568 3700 LA Garrett Aviation
561 233 7242 PB Jet Aviation
561 686 7553 PB Jet Aviation
617 569 5260 Boston Signature Flight
617 569 1606 Boston Signature Flight
505 471 2525 Santa Fe Capital Aviation
614 239 8828 Columbus Pilot Off. Fax
614 237 3747 FBO Lane Aviation
201 624 1660 Newark
340-777-9177 Bohlke International Airways
201-288-1740 Atlantic Aviation-Teterboro
201 288 5040 Million air
561 683 4121 Galaxy
800-942-7738 LAX Garrett Aviation
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425 882 8069
Email: linda@iocaline.com
(Hm)3226 Cascaida Ave South
(not living here until 6/03)
Seattle, WA 98144
206 760 3226 home
206 760 3227 home & office
425 936 1826 direct line
425 705 6888 Linda Toscano
(asst.)
lindastone@MSn.com another
e-mail
425 703 7094 fax
206 465 3029 p
425 705 6954 Tamara (w)
206 335 5594 Tamara (p)
206 760 3228 (hf)
310 722 9948 Emergency contact
Kelly Bovino

Stroll, Lawrence S.
Chairman
AIRL Investment Group
550 7th Avenue
7th Floor
New York, NY 10018
212 894 9984 (w)
514 487 8173 (h)
Email: claireanne@strollfamilly.
(Hm)7077 Avenue du Parc, Suite
502
Montreal, Quebec
Canada H3N 1X7
514 487 8173 Canada

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C.1fax

1 718 289 2171 (cell)
1 514 577 2885 (p)
1 514 487 8173(f)
1 514 278 6000 (w) Montreal
1 514 278 6184 (wf) Montreal
1 212 548 1350 (wf) NY
011 44 207 8810906 (h) London
1 784 458 3439 (h) Mousticue
1 784 493 4010 (p) Mousticue
1 514 487 8173 (h) Claire Ann
514 953 6009 wife n
011447860923694 John-Stroll's chauffer
212 548 1909 Silas's fax #
212 548 1350 Stroll;s fax
819 425 8825 new country house

Tafoya, Craig
Fraser Yachts
2107 Southeast 18th Street (h)
Fort Lauderdale, FL 33316
954 763 5093 (h)
954 763 9484 (f)
Email: tafoyac@aol.com
(Hm)1800 S.E. 10th Avenue
Suite 400
Ford Lauderdale, FL 33316
954 328 6203 (p)
954 712 0435 (w) direct
954 763 1053 (w)
954 684 1384 Emergency

Tobiason, Larry
Lawrence F. Tobiason Assoc.
6 Hillside Ave.
Winchester, MA 01890 (h)
5722 Freeport Court
Westerville, OH 43081
001 614 855 2310
614 855 1736
001 614 895 0749 (h)
001 617 729 1111 (b)
001 617 729 2519 (h)
001 614 391 4969 (c)

Trossle, Bob
Miller and Raved
914 634 7476(h)

Trump, Donald
The Trump Organization
721 Fifth Avenue
New York, NY 10022
212 832 2000(w)
212 755 5230 (f)
Email: melaniakmelania@aol.com
(Hm)Mar-a-Lago Club
1100 South Ocean Blvd.
Palm Beach, FL 33480
561 833 2466 (h)
561 832 0034 (h)
561 832 2600 (spa)
212 453 7214 (Car)
Howard Willson Houseman
561-832-0079 (h)
212-832-9191 (h)
561 832 2600 Mar-a-lago
212 308 5758 Trump Security
212-715-7220 Norma direct-emergency contact
212 879 6111 Milania
917 584 8222 Milania p
561 832 2669 (hf)

Trust, Marty
Mast Industries, Inc.
801 North County Road (h)
Palm Beach, FL 33480
978 975 6100 (w)
978 975 6116 (w)
Email: mtrust@mast.com
(Hm)100 Old River Road
Andover, MA01810
561 863 7377 (h)
561 863 6476 (h)
617 426 9543/44 Boston (h)
617 338 1461 Boston (hf)
561 863 7376/667 (h)
561 863 6476 (hf)
603 490 3660 (Car)NH
888 611 7332 (b)Wife
978 397 3033 (p)
917 699 4247 (p)
561 358 4347 Wife
561 371 4885 Wife
978 683 2788 (wf)

Tuckerman, Steve
Tuckerman Optical Co.
5000 Kilzmiller Road (h&w)
PO box 488
New Albany, OH 43054
614 775 4002 (w)
614 775 4004 (f)
Email:
stevetuckerman5000@msn.co
614 775 4000*** (h)
614 775 4004 (hf)
312-649-9182 Chicago h
614-271-3677 Wife's Car
614-206-3900** (p)
614 370 7373
970 925 8817 Aspen f

Ugland, Peg
7026 Wichita Drive
Dublin, OH 43017
614-764-9847(h)
614-989-0047(p)
Email: pegu@inaproperty.com
(Hm)Napi (naw) 6525 W. Campus Oval
Suite 105
New Albany
Ohio, 43054
614-422-0606 Richard Ugland
614-939-6000 w
614-939-6003 w direct
614-939-6029 fax
614-939-6007 F direct

UPS
Account # E10-954
Domestic 800 742 5877
Internati 800-782-7892
ups)

Valukas, Tony
Jenner & Block
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Chicago, Illinois 60611
312-222-9350
312-527-0484
708-866-8348 Home

Visoski, Larry
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Singer Island, FL 33404
561 842 0345(h/f)
212 737 9536(h)
917 868 6145 (p)
44 776 599 0076 Euro (p)
505 832 2699 (h) Sante Fe
561 543 7513 (p) back-up
1 614 433 7062 David Rigg
Chief Pilot

Wachner, Linda
Warnaco, Inc.
200 East 65th Street #36S
New York, NY 10021 (h)
90 Park Avenue 26th Flr.
New York, NY 10018
212-370-8204
212-587-6771(f)
331-4742-8132 Paris (w)
310-473-0032 Sepulveda
310-476-0475 Sepulveda (f)
212-370-8204 Direct
212-370-8205 Secretary direct
212 308-1264 (hf)
212-751-3988 (h)
303-925-9029 Aspen (f)
303-920-2021 Aspen (h)
516-287-3178 S. Hampton
516-287-4865 S. Hampton (f)
0607 971 212 Claude-Paris Driver
917-856-3058 (p)
011-336-0726-5960 (p)

Wahl, Francis
41 22 93 97000 (w)
Bernheim Halperian Ming Ducret
5 Avenue Leon Gaud
1206 Geneva Switzerland (w)
27 Chemin de L'Ermitage (h)
de La Belotte, Vesenaz, Switz
1222
4122-752-5990 (h)
4122-347-6831
41-77-24-0330 Portable
41 22 752 59 94 fax
33 607 187 263 Portable
335 56 22 12 33 Le pyla fax
335 56 22 13 50 Le pyla home

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Wallaert, Alexia

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Paris, France 75116
011 33 6608 17425
011 33 66 081 7425 p
(Hm)1 Rue de la Tourelle
Boulogne Billancourt
France
92100
011 33 493646157 Canne
0606471510 mum's p
011 39 059 225 296 Alexia home in Italy
347 417 0981 NY cell
011331450002 07 Fax
011 33 145 0002 07 Cellular

Wasche, Cristalle

10 E 29th St.
Apt #18H
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646 232 3311 (p)
212 696 2315 (h)
Email: cristalle@earthlink.net

Wexner - Abigail Plantation

6619 Tallassee Plantation Circ
Albany, GA 31707
229 483 0638
229 463 9843(f)
229-435-5932 Darrell Halstead
229-889-6637 Darrell Pager

Wang, (Becker) Vera

Vera Wang Bridal House, Ltd.
778 Park Avenue (73/74)
New York, NY. 10021 (h)
25 East 77th Street
New York, NY 10021
212-879-1700
212-879-1690
(Hm)Showroom (SEND ALL MAIL)
225 West 39th Street
9th Floor
New York, NY 10018
212-288-3380/9468 Home
212-737-9723 Home Fax
212-628-3400 NY Bridal
516-283-7914 South Hampton
516-287-3090 South Hampton Fax
212-375-1212 Portable
212-375-0101 Car
331-4727-3789 Paris - Concierge Msr Fernaces
331-4553-7876 Paris - Apt
212 575 6400 Showroom
561 655 5676 PB
212 719 1986 showroom fax

Wexner - Flight Dept.

4387 International Gateway
Columbus, OH 43219
614-479-7063
614-239-7043
614-239-8490 Tim Stehly
614 203 9895 Tim Stehly (p)

Wexner, Les

78 Mount Street
London, United Kingdom W1K 2SL
44 20-7499 7711 Home
44 20-7499 8763 Home - fax
4437 427 8744 Range Rover-London
0831 355 956 Mercedes
011-44-365-323-501 David Byrne-portable
plane 0385-325-944
4471-499-7711 Home
4471-499-8763 Home - fax
4437-427-8744 Range Rover-London
0831-355-956 Mercedes
0831 355956(merc)
0374 276744(range rover)
011 44 370 883 954 Mercedes
Mobile Phone
011 44 370 883 955 Range Rover

Mobile Phone
011 44 370 888 011 Bently Mobile Phone

Wexner, Les

One Ranch Road
Aspen, CO 81611
303-920-4440 Curt Ulkes-Admin #
970 920 0436 Curt Ulkes - Personal Mobile
970 920 8723 Curt Ulkes - Personal Page
970 920 8586 Curt Ulkes
970 920 8589 Curt Ulkes Page
970-920-1600 Main Line
970 925 8817 Main Fax
970 379 6571 Jeep Cherokee 1991
970 379 5673 Jeep Wrangler 1991
970 379 6570 GMC Pick-Up 1994
970 379 6574 White Range Rover
303-920-1600
303-925-8817 Fax
970 379 6573 Jeep Grand Cherokee 1993
970 379 7215 Curt Ulkes P.O.V.
#970 379 7215 Curt Ulke's P.O.V.

Wexner, Les

Abigail House
One Whitebarn Road
New Albany, OH 43054
614 939-3000
614 939-3062(f)
614 370 7780 BMW - 750 IL 1996
614-271-3000 Mercedes - 500 SEL (Mrs. B)
614-939-3065 Estate Office
614-939-3061 Abby (w)
614-736-6040 Merc 560SEL '89
614-395-0515 Merc 600SL
614-736-6066 Abby's Jeep
614-371-2042 OPO Jeep
614-271-3646 Jeep reg EKD 479
614-939-3070 Command Center
614-939-3075 Main Gate

614-855-8017 Constuction Gate
614-939-3000 Command Center
614-939-3062 Abigail Hse (f)
614-939-3055 Karl Koon
614-939-3000 House
614 648 1483 Merc 450SEL 1979
614 370 7065 Land Rover 1996
614 619 6066 Porsche 1997
614 370 9810 Lincoln Town Car 1997
614 329 8992 Suburban 1997
614 648 9202 Merc 1997 600S
614-939-3070 Command Center
614-939-3063 Command Center Fax

Wexner, Les

The Limited Inc.
Three Limited Parkway
Columbus, OH 43230
614-415-5001
614-415-5008 F
Email: dryan@limitedbrands.com,
614-415-5000 Main line
212 439 4222 Daina Ryan
614 415 7000 information
212 650 0477 NY h
614 415 5006 Daina Ryan direct

White House

Main Line (Information)
1600 Pennsylvania Avenue, N.W.
Washington, D.C. 20500
202-456-1414

Whitehead, Jim

301-681-3444 (w)
301-593-8407 (h)

Wolman, Herb

Insurance Office Central Ohio
253 North Columbia Avenue (h)
Bexley, Ohio 43209
38 Jefferson Avenue
Columbus, OH 43215
614-221-5471 Work

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614-221-4776 Fax
614-221-5471 Office
614-252-2463 Home Ohio
212-472-3134 Home NY
614-395-4222 Portable
614-221-3437 Office After Hours
Home 614 855 2463

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Boston Properties
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212 326 4010(w)
212 326 4096 (f)
Email:
mzuckerman@bostonproperti
(Hm)Boston Properties
8 Arlington Street
Boston, MA
212 744 3995 (h)
212 879 4663 (hf)
212 326 4012 Clare Asst.
212 326 4096 Clare (f)
970 920 2983 Aspen (h)
970 920 3141 Aspen (f)
631-324-7086 E. Hampton (h)
631- 329 -5711 East Hampton (f
202 537 0324 DC (h)
202 537 1435 DC (hf)
202 955 5537 DC (w)
617 859 2612 Bill Wedge (w)
617 859 1555 Bill Wedge (f)
617 859 2600 Boston (w))
917 750 1900 (p)
631 324 7084 (h)
631 329 5711 (hf)
954 648 1281 (boat)
011 39 335 5645933 (boat)

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116-4497 pin #
Email: rb9east71@aol.com
(Hm)1800 skypage
917 940 6157 (p)

212 249 1122 (w)
212 249 1113 (w)
717 383 2733 Patricia Hughs
(Mom)
516 883 6498 (f)

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31100 Toulouse, France
011 33 68 294 0794
Email:
magali.blachon@wanadoo.fr
01133682940794 cell
1 917 553 0139 (p)
1 212 996 1127 (h)
01133 561 41 75 00 Parents

Epstein, Jeffrey
9 East 71st Street
New York, NY 10021
212 772 9416(h)
212 879 0840(f)
Email: jeeproject@yahoo.com
(Hm)Merc Garage
124 East 63rd St.
Account# 047-EP02
1 917 545 6300 Michael (p)
1 917 309 0259 Dennis - Flowers
917 553 0139 Magali (p)
212 772 3733 Rich (f)
212 772 0517 JEE extra line
212 249 8510 GM
212 717 4672 GM (f)
917 860 9177 Merc
917 597 8141 Merc
917 855 6931 Tahoe-JE
917 494 9690 Tahoe-GM
212 772 3853 Staff 1
212 772 0939 Staff 2
212 772 3733 Staff (f)
212 249 1122 Richie Line 1
212 249 1113 Richie Line 2
917 940 6157 Rich (p)
212 535 7374 Ryan(h)
609 915 9311 Ryan (p)
917 856 1285 Lynn (p)
212 517 3215 Lyn & Jojo (h)
917 975 4500 Jojo (p)
212 249 6514 Merc. Garage
212 744 5511 Tahoe-Garage

116 4497 Rich (b)
807 0253 Jojo (b)
130 4666 Lyn (b)

Flowers-Gary Baura
Flowers
001 917 207 2236
212 675 2476 PM only
Email: bauranewyork@yahoo.com

Fontanilla, Lynn & Jojo
aka Rosalyn & Luciano
301 East 66th Street (h)
Apartment 5C
New York, NY 10021
212 517 3215 (h)
800 759 7243 JoJo Skytel pin#
807 0254
800 759 7243 Lynn Skytel pin#
130 4666
917 856 1285 (p) Lynn
917 975 4500 (p) Jojo
212 772 3853 (w) 71

Gaston Steve
310 E. 55th Street #11F
001 212 888 9146(h)
001 917 608 6685(p)

Graces Marketplace
1237 Third Avenue
New York, NY 10021
212-737-0600
Acct # 5002

Hamblin, Sue
41 Meadow Way
Constantia Meadows
7806, Cape Town South Afri
01127 827 795 782(p)
01127 21 761 8442(b)
Email: suehamblin4003@yahoo.com

Miller, Charles
Miller & Raved
Half moon Bay 609 (h)
Crotin on Hudso, NY 10520
914 235-6655 Work
914-235-5005 W Fax
Email: cmi3540012@aol.com
(Hm)Miller & Raved Inc.
2 Hamilton Avenue
Suite 207
New Rochelle, New York 10801
914-632-3555 Bob
914 271 5579 (h&f)
917 750 4797 (p)
246 419 1345 (h&f)
207 348 2600 (main
917 846 4295 (emerg.)
212 343 1645 +225 (w emergency)
212 965 1069 (h emergency)

Sawyers Tom/Pat (telephones)
Barbara Wife)
133 County Rd 513
Frenchtown, NJ 08825
908-996-6903(o)
908-996-6958 (f)
908 581 2641(oh)
Pin# 5460174 Tom beeper 1 800
759 7243
pin# 4195978 Pat beeper 1800
759 7243
(610) 749-2939 Pat's home
908 581 2641 (Pp)

Tindall, Brent
301 East 66th Street
Apartment 8C
New York, NY 10021
917 601 4143 (p)
212 535 7374 (R)

GIUFFRE0016:
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KENYA (K)

Muthaiga Club
010 254 2 767754/5/6

KINNERTON

Airport Transfers
0207-403-2228

Charlie
0208-994 5458
0956 210252

Chelsea Police Station
0207-741 6212

Coles, Alan
Registered Osteopath
The Brompton Health Clinic
221-223 Old Brompton Rd.
Earls Court SW5 0EA
07802 626 109
(Hm)Courtfield Medical Centre
73 Courtfield Gardens
Earls Court SW5 0NL

Drivers
welcomeminibus@, hotmail.com
020 8866 6644 Les Wallace
07806 324400 Les (p)
0208 866 6644 Les (h)
0797 314 2340 Ray Perkins (p)
0793 132 5729 Walter (p)
0795 632 4328 Walter (p)

Entwistle Isi
0797 0888989
0208- 870 7348

Hair Assocs
Denise
0207-245 0077
0207-235 3231

Harrods Limited
071-730 1234
#87
135 Brompton Road
Knightsbridge, London SW1X7XL
071-730 1234

Harvey Nichols
071-235 7207

Holland & Holland
071-499 4411
212 752 7755 (NY)

Jackson Stops
Jolyn & Benson
0207-581 5881

John Hobbs Ltd.
105/107A Pimlico Road
London, SW1W 8PH
0207-730-8369
0207-730 0437 (fax)

La Famiglia
351 0761

Martin Tim/Debbie Stewart
Grosvenor Estate
0207-408 0988
0207-312 6201(td)

Martine
0207-235 0998(w)
0207-244 6636(h)

Massage - UK (a)
0208 715 6200 Liz
0976 263 625 Liz
0208 747 1268 Annabel
079 7753 5377 Barry cell
016 2848 8654 Barry
0207 924 1897 Joanne Brunt
0402 256 289 Joanne Brunt
31(0) 616 300982 Barry (Amsterdam)
310 821 2799 Barry(LA)
0776 765 5220 Maxine cell
631 329 3869 Maxine NY
07000378737 Lisa dstress
644 GM dstress membership #
077 4768 5190 Bernice Palazo (Stroll's)
0790 262 6109 Alan Coles (osteopath)
0207 251 6109 Felicity (Thai massage)
079 4093 7382 Felicity (p)
0870 225 5007 Unlisted London
Charie Eiling/good unlisted/0870 225 5007

Maxwell, Ghislaine
44 Kinnerton Street
London, England SW1X 8ES
0207-838 9128(h)
0207-838 9129(h)
Email: 2512 *21* #21#
(Hm)fedex package to:Simon Edwards
Alexander Mann Global Markets
Alexander Hse, 9-11 Fulwood Pl
London, England WC1V 6HG

0207-838 9130 2nd Line
0771 423 6573 Range Rover
07785 771552 (p)

Minicabs
0800-654321

Nags Head
Kavin & Valerie
0207-235 1135(w)
0207-931 0789(h)

O'Neil Nessa
0207-235 1209(h)
0831 458686(p)

Oping
01865 726297

Outred, Anthony
533 Kings Road
London, England SW10 0TZ
0207-730 4762
0207-376 3627
0207-736 8756 Home
0208-965-8733 Hedly's Humpers (Movers)

Police 24 hours
0207-321-8273

Range Rover
0771 4236573

Ray John
001 212 715 7227(w)

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Stichcraft
071-629 7919

Toblas, Maxine
Yoga -UK
0207-351 7690
00 631 329 3869
Email: maxinelena@aol.com
07767 655220 (p)
516 329 3869

Unlisted London
Contact: Debbie Nichols
0870 225 5007 (w)

Yara
0207-349 0652

MEDICAL

Birnbaum, Dr
449 East 68th Street
at York
Suite 8, Second floor
NY, NY 10021
212 628 1500
212 288 5760(f)
John Scobell

Burman, Dr.
Vet for Max
52 East 64th Street
New York, NY 10021
212-832-8417

Chiropractor
Dr. Dean
Chiropractor
2067 Broadway between
71st & 72nd
212 712-2195

Chiropractor
Chiropractor
Calakos, Dr. Dean
370 Columbus Ave.
(between 77th & 78th streets)
1F
NY, NY 10023
212 712 2195

Cope, Bruce
GM Dentist
2 Harcourt House
19A Cavendish Square
London, UK W1M 9AD
0207-580 0646(w)

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212 838 3155

Dr. Dean Calakos
370 Columbus Avenue
#1F
New York, NY 10024
212 712 2195

Dr. Farkus
30 East 60th Street
201 Floor
212 355 5145

Dr. Ray, Dr. Kashel
Paula's Dr's
561-478-1104

212 717 1688 fax

Dr. Schimoni
212 751 5066 (w)
917 922 7391 (p)

Ear Conning
310 West 72nd Street
NY, NY
001 212 580 3333

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79 Cadogan Place
London
SW1X 9RP
0207- 351 3454 (h)
0836 236965
0207- 351 6801 (h)
0207-730 3700 (w)

Hirshfield, Dr.
614-864-6016 (f)
614-252-2034 (h)

Ishmail
177 Prince Street
(between Prince & Thompson)
212 353 2038
917 865 0394

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Park East Animal Hospital
52 East 64th Street
NY, NY 10021
212-832-8417

Krumholtz, Dr. Michael
111 East 60th Street
NY, NY 10021
212 734 5533

Lee, Dr.
614-868-5966
614-457-9585 (h)

Lister Hospital
0207-730 3417
0207-235 2672

Magnani, Dr.
501 Madison Ave. Suite 2101
(btwn 52nd and 53rd St)
New York, NY 10022
212 688 1030
203 629 5608(h)
212 755 3156 fax

Medical
4311440*01 Oxford ID number(gm)
133 76 4883 Prudential ID number(gm)dental

MedLink Emergency
001602 239 3627

Meltzer, J. Dr.
903 Park Avenue
New York, NY
212-988-4488
212 535 4796fax

Moskowitz, Dr. Bruce
1411 North Flagler Drive
Suite 9300
WPB, FL 33401
561 833 6116 (w)

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561 848 7884 (h)
561 833 6351 (wf)
x21 Melanie
561 833 1628 direct to Moskowitz desk

Oxford Health Plans
800 201 4911
800 444 6222
4311440*01 Member number

Prudential
800 843 3661

Steinburg Dr
NY Hospital 525 E 68th St
001 212 746 4100

Sternberg, Esther Dr.
3610 Uptown Street N.W.
Washington, Dc 20008
001 301 402 2773(w)
001 202 237 8020(h)
Email: sternber@bellatlantic.net

Tom, Maggie
0207-486 9272

Victor, Steve Dr.
30 E. 76th St. (P&M) 6fl
NY, NY 10021
212 249 3050 (w)
212 988 5026 (f)
(Hm)845 UN Plaza, apt 32A
New York, NY 10017
001 212 628 5210 (h)
001 516 354 3304
917 913 9029 (car)
516 329 5873 Beach
917 226 1554 (p)
516 625 6222

212 249 1482 (wf)
917 328 8655 emergency

Wyntik, Wayne
Chiropractor
212-249-7790

PB

Babor
561 832 9385

Bard, Dr. Perry
4275 Okeechobee Blvd (w)
Suite H
WPB, FL 33409
561 640 9999 (w) WPB
Email: docbones77@aol.com
(Hm)3636 S.Ocean Blvd
Highland Beach, FL 33487
561 266 5765 (h)
561 302 1844 (p)

Breakers, The
561-655-6611
Account # 17313

Chiropractor
Dr Bard
001 407 640 9999

Cleaners
Francis Pawdon
561 833 4486
1 561 820 4642 (w) Bill - husband

witness

Creative Custom Swim-wear
Jupiter Town Center Plaza
711 W. Indiantown Rd.
Jupiter
FL 33458
561-747 6424

Devito, Dawn
267 Atlantic Ave.
Palm Beach, Florida 33480
212-750-9198
(Hm)144 Pleasant St.
Watertown
MA
02172
561 832 4616 Palm Beach Home
617-926 7877 Boston:
401-423-9886 Rhode Island
561 248 3445 (p)

Driver - PB
305 491 1998 Ray

Epstein, Jeffrey
358 El Brillo Way
Palm Beach, FL 33480
Email: jeffreye@mindspring.com
561 309 6415 NY Merc
561 655 7626 JE Line 1
561 655 7629 JE Line 2
561 655 2779 JE Line 3
561 655 3704 JE Line 4
561 655 4870 GM
561 820 8790 (f)
561 655 0995 Main house kitchen
561 804 9849 Main house kitchen (w)
561 379 9390 Armored Merc S500 (front)
561 309 6415 Armored Merc S500 (back)
561 818 8867 Guest Merc S600 (front)
561 758 1672 Guest Merc S600 (back)
561 346 7141 GM Merc SL55

561 762 6380 New Suburban
561 371 1686 Staff Suburban
561 832 0232 Staff House Line 1
561 832 0319 Staff House Line 2
561 832 0414 Staff House Line 3
561 832 4533 Staff House Line 4
561 818 8361 Mike (p)
561 818 8398 Sally (p)
561 369 4354 Jerome Pierre-gardener
561 641 0728 Jerome Pierre-gardener (h)
561 350 1700 Christophe
561 686 3707 Paula (h)
561 308 8684 Paula (p)
561 762 2741 Paula (car)
718 449 5440 Fay Goodman
310 306 1362 Ronnie Carey (h)
310 215 0303 Ronnie Carey (w)
4710157 # Call forwarding

Gaie, Christophe
6102 Wheatley Ct
Boynton Beach
FL 33436
561 350 1700 (p)
561 233 7242 (p)
561 233 7240 (f)

witness

Goldman, Francis
122 Lake Rebecca Drive
Golden Lakes, FL 33411
561 656 4409

Goldsmith, Gerald
220 Wells Road
Palm Beach, FL 33480
561-659-0441 (h)
561-659-7433 (hh)
(Hm)Palm Beach National Bank
125 Worth Ave.
Palm Beach
FL 33480
772 971 1000 (p)
561 653 5586 (w)
561 650 0866 (wf)
212 319 9404 (w)
212 659 1433 (w)

GIUFFRE001662
HOUSE_OVERSIGHT_014216

212308 0519 emerg.

Maronet, Bill
ETC
561-881-8118
Phones

Massage - Florida (a)

561 467 2588 Dawn W-R(b)
561 776 5679 Dawn W-R (h)
561 832 4616 Dawn James (Devito) (h)
561 564 4272 Cheri Lynch(b)
561 743 3764 Cheri Lynch(h)
561 627 5816 Dawn W-R (w)
561 373 1412 Cheri Lynch(p)
561 758 1011 Alison Chambers
561 799 9176 Jodie
561 222 0864 Jodie (p)
323 314 2740 Alexandra (p)
561 650 0185 Johanne (h)
561 589 8116 Alexandra (h)
561 714 0546 Johanna's cell
561 704 0676 Tammy (p)
561 775 9324 Amy Birse(mom p)
561 622 0062 Amy Birse h
561 333 7493 Melissa Hanes-dad
561 670 8562 Vicky (p)
561 745 9574 Vicky (w)
561 967 1496 Lisa Sturgill(Mass/Fac.(Tammy
561 789 3371 Lisa Sturgil (p)
01133 680 240 365 Alexandra (gars-p)
561 655 1849 Amber (mom)
561 799 4519 Virginia (parents)
954 467 0412 Katja (h) Gypsy's girl
561 586 4625 Geri Kay (h)Mass/Fac.(Tammy)
561 738 5846 Geri (h)
561 309 0079 Dawn WR(p)
561 385 5444 p Janine (red head)
561 624 5679 Melanie(h)
561 212 2702 Melanie (p)
561 351 0944 Melissa Hanes (p)
561 575 9514 Jennifer
561 301 8887 Amber (p)
561 655 5169 Amber (mom)
561 533 7121 Katja Bringham
561 471 3984 Caroline Adriano boyfriend hse
561 707 1789 Dominique & Kelly
561 714 9719 Mary Southwell
561 369 6874 Christina-Virginia's friend
561 379 3177 Amber (mom-p)
561 478 0496 Caroline Adriano home
561 533 7599 Diane Cahill (h)
561 312 1408 Diane Cahill (p)
561 798 6103 Andrea(Tony's friend)
561 358 9837 Heidi
561 301 3101 Nicole
561 832 6777 Nicole (h)
440 289 6551 Coleen p
561 514 1158 Cristale
561 368 6259 Cristale
352 291 7032 Michelle Bell
954 525 2084 Hawthornes
954 232 0635 Hawthornes
561 635 6359 Andrea 2nd number
561 373 9042 Amy Birse p
561 641 7658 Melissa(Carolyn's friend)
561 689 2458 Amanda Lazlo (h)
561 436 9315 Amanda (mom)
561 502 8809 Melissa'a cell(Carolyn's fmd)
561 309 7877 Beth (p)
561 554 3658 Beth
561 889 5900 carolyn (p)
561 832 6998 Carolyn Casey (h)
813 299 4573 Charlotte (18 Worth Ave) p
561 832 5008 Charlotte (w)
561 818 0296 Chelsea (p)
561 748 9105 Chelsea Facials (brunette-h)
561 373 1412 Cheri Lynch (p)
561 514 2862 Colesn
561 368 6259 Cristale
561 686 2598 Dara Preece (h)
561 742 0171 Dara (w)
561 704 8946 Dara (p)
561 625 0378 Debra (big bond) (h)
561 339 1988 Debra (p)
561 218 8667 Dina Lombardi (faciaist)
561 212 8152 Dina (h)
917 922 4359 Gwendolyn (p)
561 822 4932 Gwendolyn Beck (w)
954 525 2084 Hawthornes
954 452 8582 Heidi Kublick
561 493 6676 Jessie (h)
561 620 5564 Jessie (mom)
561 689 0648 Jill Spina
561 222 0864 Jodie (p)
305 573 6060 Karen Mesa
954 467 0412 Katja (h) gypsy's girl
954 442 3309 Kiery (Lisa P's friend)
561 707 3565 Kristen (carolyn's friend)
561 329 0213 Kyle
561 791 0535 Laura Kline
561 815 6223 Lina (cosmo & co)
561 352 0709 Lina (p)
561 346 2803 Lina (p)
561 627 9966 Maura (h)
561 762 7126 Maura Koons (p)
561 502 8809 Melissa (carolyn's friend) p
561 333 7493 Melissa (h)
561 383 7738 Melissa Hanes (h)
561 351 7248 Nela Estonia (p)
561 301 3101 Nicole
561 848 3073 Sheridon (h)
917 601 2111 Sheridon (p)
561 227 2435 Sheridon (w)
561 881 6998 Symar (b)
561 588 5444 Tammy (facialist)
561 798 6216 Stephanie
561 685 0544 Jennifer-gymnast
561 253 4832 Ashley(Toby)
561 588 5444 Tammy (Facialist)

Maxwell, Ghislaine
358 El Brillo Way
Palm Beach, Florida 33480
001 561 655 4870
001 561 832 3816 com
001 407 346 7141 Mercedes
001 407 655 3704

~~Michael & Sally~~ A.R.
PB house managers
1 561 818 8361 (Ep) Lovelz
1 561 818 8398 (Ep)
Email: pbmanager@earthlink.net

Mike Pezulo
El Brillo neighbor
561 655 6210(w)
800 854 9192(pgr)

Mogens, Larry
561 655 5510

Police PB
Jennifer Bruno (cop hire)/Pat
561 227 6358
561 838 5476
Him|Capt Gudger
561 227 6365
561 838 5470 Joe Recarey
561 308 1546 Tom Mellinchok
561 838 5470 Sgt Trilych

Pompano Helicopter
1 800 957 4374
954 931 7186(Steve)

Stopek, Alan
Xyle|ahloem
14372 Horseshoe Trace
Wellington, FL 33414
561 793 7303(w)
561 793 9674 (wf)

Vet
Jack Liggett
561 659 2208

RANCH (RH)

Bodie John
Piano rental SiFe
001 505 884 4530

GIUFFRE001
HOUSE_OVERSIGHT_014217

212-595-7171
212-489-1818 home

Ellis Freedman
001 212 758 9593 (h)
001 212 351 3092/ 91 (w)

Grumbridge, Malcolm
Solicitor
The Hogarth Group
1A Airedale Avenue
London, England W4 2NW
0208-995 1515 (w)
Email: mcg@thehogarth.co.uk
(Hm)31 Cleveland Avenue
London, W4 1SN
0208-995 0975 (h)
0208-995 1373 (f)
0208-994 0929 (w) switch board
0385 365 616 Car
0385 248887 Portable
44 20 8995 1515 wf

Lemaine, Pierre
00 33 1 4329 4465 / 5184
00 33 1 4325 4080 (f)
00 33 1 4402 3414 / 000926
00 33 1 4345 5191 (h)

Marden Scott and Sarah Nurse
001 212 595 1619(h)
011 212 702 8680(w)

Marden Scott and Sarah Nurse
001 212 595 1619(h)
011 212 702 8680(w)

Marden, Scott & Sarah
001 212 702 8602(w)

212 595 1619(h)
212-595-1617 work
212-595-1619
212-272-6050

Miranda, Bob
001 914 739 6879 (h)
001 212 345 8408 (w)

Moss Brian /Carolin Coleman
01865 881165
01865 881153

Nesson, Mauri
001 212 724 9070
001 303 925 8817 Aspen

Oliver, Keith
Peters & Peters
2 Harewood Place (w)
Hanover Square
London, W1R 9HB
0207-629-7991(w)
0207-499-6792(wf)
Email: keoliver@petersandpeters.
(Hm)Flat 1 (h)
Statham Court
20 Tollington Way
Holloway, London N7 6FP
0207-409-9703 Direct
07785 232 122 (p)

Onakewe, Rodolph
47 Rue de Chaeillot
Paris,
33 1 4723 0063

Ord, Robert
01491 652642(h)
0385 307809(p)

0836 208089

Paul Cox
7532206

Peters & Peters
Keith Oliver/Helen Mcdowell
2 Harewood place
Hanover Sq
London W1
0207-629 7991
0207-491 3035
0207---499 6792(f)
0385 232 122

Pisar, Samuel
011 331 4766 0212(w)
011 331 4622 8203(wf
011 331 4501 8718 (h)
954 457 9267 holiday #
212 744 0727 (h) NY
011 331 4401 4401 Caroline Gravisse
011 331 4415 9415 Caroline Gravisse (f)
212 744 0836 (f)
011 331 4501 2384 (hf)
011 3314486 4676 Mme. Gravisse
212 829 8800 x15 Leah Pisar (w)
917 664 8243 Leah Pisar (p)
212 829 8800 x15 Leah Pisar work

Posen, Felix
24 Kensington Gate
London, W8 5NA
0207-584-9330 home
0207-584-0915 off.
Email: nesop@dircon.co.uk
0207-584-0904 (f)
(0)1342-833133 Crowhurst
(0)1342-833568 (f)

Shaw Derek
0205 820944

Shelly Aboff
001 203 532 0453 (w)
001 203 622 5905 (h)

Tony Busby
0865 60684 X3593

Travis, Paul
0342 844686

Tutle, Jim
(732) 248 1847
0867 358822 X3577
0867 358822 X3577

White, Justin
0785 724 372
0785 724 372

RUGS

Pierre, Jerome
Gardener at PB house
561 369 4354
561 547 3575
561 541 7955 (p)

SECURITY (SC)

Scotland Yard
0207-230 1212

GIUFFRE001664
HOUSE_OVERSIGHT_014218

South Ken
0207-741 6212

The Home Office
0207-273 2124

SWITZERLAND (SW)

Bristol Hotel
10 rue du Mart-Blanc
Geneva, Switzerland 1201
4122-732-3800
4122-738-9039
331-42-669-145 Paris

The Corveglia Club
010 41 8234864

The Steffani
010 41 82 22101

TRAVEL (T)

Aero Leasing
(1) 814 3700 (Zurich
(22) 984510 (Geneva)

Air France
1-800-237-2747
0820 820 820
1023994284 frequent flier (GM)
1023994343 frequent flier number (JE)

Air Hansen
(Helicoptor)
0252-290-089
0252-860-287

American Airlines
Kay Leonard,
Special Services:
Val Cushing - Gatwick
293 58783
75261 9047
800 433 7300
1-800-862-8680 AA Frequent Flyer Dept.
340 774 6464 St T Brenda Boone (special sev
305 526 7710 Susan Michado Miami special se

American Express
American Express
1-800-297-6453
1-800-297-3276 Membership Rewards
877 877 0987x57323 Amad Abdullah (Cent. Travel)
877 877 0987x6775 Ian Roche (Cent. Cards)

AT&T
1-800-225-5288

British Airways
001 800 247 9297
0845 779 9977uk
91088094 Pin 9919 club number (GM)
91859156 club member (JE)
0208-759 5511 Claire McArdle
0208-564 1680 Jilly Rutherford
718 425 5585 Roz Ollivier/Special Services
718 425 5654 Alan Jacobson/special services
212 452 5353 Roz home (emergencies)
718 553 5585 Penelope Foy (special services
718 425 5585 Bernette Berry - Spec. Rep.

Citicar
3515 37th Avenue
Long Island City, NY 10021
718-707-9090
800-456-3548
718-361-9900 Ellen/Tackle
800-456-3548 Toll-Free Number
718-361-8834 when ph system is down

Concord Tickets
David Gladwin
19 Main Street, Keyworth
Nottingham NG12 5AA, UK
0115 9372455 (t)
0115 9376930 (f)
612 931-0490 (Fisher) Susie Simon (h)
212 288-9088 (Wilpon) Michael Holtz

Continental Airlines
001 800 525 0280
#SM147662 frequent flier number (GM)

Delta Airlines
001 800 323 2323
2102103435 frequent flier number (GM)
1-800-325-1999 Flight information number
2001009253 frequent flier number (JE))

Delta Dash
1-800-638-7333

DHL Courier
800-225-5345

Flight Options
26180 Curtiss-Wright Parkway
Cuyahoga County Airport
Cleveland, OH 44143
877 357 1263 (w)
216 797 3325(wl)

Flyaway
081-759 1567/2020

Frequent Flyer Clubs
Delta One Pass
001 713 952 1630
001 800 221 1212
#2102103435 frequent flier number

Garnero, Jr., Mario B.
011 55 11 9970 1020
Email:
mbgarnero@brasilinvest.co
646 251 2211 (o) Europe
011 331 4720 1864 Paris

Helicopters
Jean-Jacqlues Moinat
Nice Helicopteres
Aeroport Nice Cote d'Azur
Terminal1
06281
Nice, Cedex 3
04 93 21 34 32
04 93 21 35 64 (f)
Email:
nicehelicopteres@wanadoo.
06 14 358 353 (p)

GIUFFRE001665

HOUSE_OVERSIGHT_014219

Hickery, Eileen
Special Services, NY
101-69585 BA

Immunisation
071-439 9584

Kent, Geoffrey
Abercrombie & Kent
9301 North A1A
Suite 1
Vero Beach, FL 32963
561 388 0145(w)
800 588 0145(w)
561 388 2756 fax
01144 207 559 8797 London Number

London Airways
0207-403 2228

Lonsdale
Karen
0207-636 1313

Net Jets
Richard Santulli asst. Carol 732 326 3726
914 536 5254 Peggy Culver Feign
212 879 7577 Peggy (h)
732 326 3833 Peggy (w) asst Erin
00 35 121 446 8484 Portugal

Nite & Day
570 Moonacha Road
WoodBridge, NJ 07075
201-933-7556

Northwest Airlines
001 800 225 2525

Omar
Travel Agent
Alfa Travel
827 Ridgewood Ave
N. Brunswick, NJ 08902
001 908 435 0555
001 908 435 0660(f)

Phone
1800 414 9898(my)
212 336 8300 (9366)
(Hm)UK 0181-286 3310 (1211)
ring h answ picks 2512*21*2512 h.no. tel no.&#
*71 enter 1 no. se deact * 710 send wait tone end
01 510 317 7726 Voicestream
00 800 99 0011 ATT access for France
72# enter number activate call forward on site
73# enter number deactivate forward from site

Pisa Brothers
Rockefeller Center
630 Fifth Avenue
New York, New York 10111
212 265-8420
212 265-8753 (f)

Plane Charter
Chauffeir
01252 377 880
01252 377 872 (f)

Platinum Travel
1800 525 3355
371385847234008 Plg(GM)
3713 8182 5931 004 Pla (JE)
371846368841034 AMX (GM)
3718 463688 41000 AMX (JE)
5263 2710 0944 295 Mast (GM)

Raytheon Travel Air
George Kocher
One Pomperaug Office Park
Suite 305
Southbury
CT, 06488
203 267 5200(w)
917 863 8755(p)
Email:
george_kocha@raytheon.com
203 267 5202 (f)
1 888 835 9782 Book flight
1 888 u fly rsa
316 676 1793 Karen Jenkins
316 676 3920 Karen Jenkins Fax
877 357 1263 Flight Options

Red Carpet Limousine Company
310-552 0099

Saphire Travel
01170 522 2226

Shopper's Travel
303 Fifth Avenue, Suite 1007
New York, NY 10016
212-779-8800

Sprint
212-750-9895-3742
800 366 2663 conference call scheduling

SR Reservations
081-439 4144

Steppes East
Marc Bullough
Mick Lany
285 810267

Travel Consolidator Europe
Kevins Travel Contac
0207 373 6465
0207 637 8485 cheap concorde tickets
011 33 156213000 Succes Voyage—Pascaline

Travel Consolidators
See other numbers
800 243 2784 CHEAP
44 12 93 78 9000 Laker Airlines
212 779 8800 Ragoo
1 800 377 1000 Very Cheap Tickets (coach)
1 800 755 4333 Very Cheap Tickets
800 451 7200 Cheap Seats
212 570 1179 Cheap Seats
44-1332-331-132 Peter Koukoularides (Lonsdale)
340 774 1040 Connie
011 3902 8645 5203 Paris Concorde Mr. Capellini
01 705 22 22 26 Saphire/charters Gatewick-SLT
800 538 2583 Jet Blue
310 973 7938 Traveling Traveler/Sabatian
888 973 7938 Sabatian
800 795 8888 Ticket Planet ext. 330 Sal
212 753 1100 Homeric Tours
800 468 7477 Go Trips-Stacy PB
877 409 5838 24 hr. hotline code #E5516
732 890 4625 Raghu cell
0870 444 7224 cheapflights.co.uk
212 243 3500/Lucy
FranceTravel-airfrancediscount
0207 637 8485 cheap concorde tickets
212 760 3737 FlyTime Travel - Tashi

GIUFFRE001666
HOUSE_OVERSIGHT_014220

800 223 5866 Navigant
877 877 0987 Amex. Centurian Travel
1 800 443 7672 Amex Plat. Travel
800 443-7672 Platinum/Heather ext. 63793
800 715-4440(22339 Global Travel
310 276 2741 1st & Busi./Charlie
212 983 0779 UN Travels and Tours
323 933-6763 Domestic only mi. broker/John
800 239 8269 Virgin specialist

TWA

001 800 221 2000
#188925144 frequent flier numbers (GM)
34663436 frequent flier number (JE)

United Airlines

001 800 241 6522
#00385250614 frequent flier # G.M.
00316924999 frequent flyer # J.E.

US Air

Frequent Traveler Center
P.O. Box 5
Winston Salem, NC 27102-0005
001 800 872 4738
001 800 428 4322 (
001 800 428 4322
#136515311 frequent flier number (GM)

USA International

218 West 47th Street (B'Way)
New York, NY

Virgin Atlantic Airways

029-356-200
001 800 862 8621
#00 900 043 506 frequent flier number (GM)
00 779 044 628 frequent flier number (JE)

GIUFFRE00166

HOUSE_OVERSIGHT_014221

Epstein, Jeffrey
Fed ex Sat delivery only
c/o Dan and Nancy Sowle
Highway 41, Landon Store
Stanley, NM 87056
505 832 4339

Epstein, Jeffrey
Zorro Ranch
49 Zorro Ranch Road
Stanley, NM 87056
Email: zorroranch@aol.com
505 832 2675 Line 1 (office)
505 832 2696 Line 2 (office)
505 832 2676 (office f)
505 832 2697 Hotline Security
505 832 2698 Office modem
505 832 2240 Bunkhouse LR
505 832 2505 Bunk 1
505 832 2282 Bunk 2
505 832 2245 Bunk 3
505 832 2504 Bunk 4
505 832 2247 Bunk 5
505 832 1708 Shop Wood Shop & Greenhouse
505 832 2352 Log cabin
505 832 1348 Guest lodge cabin
505 832 1364 Guest lodge (f) & modem
505 832 0690 JE - 1
505 832 0691 JE - 2
505 832 0595 JE - 3
505 832 1394 JE - 4
505 832 5411 JE (f)
505 832 1392 JE modem
505 832 1746 GM line
505 832 1389 GM (f)
505 832 9791 GM modem
505 832 1748 Guest line
505 832 1390 Staff - 1
505 832 1391 Staff - 2
505 832 6784 Brice & Karen (h)
505 832 1393 Kate & Mike (h)
505 832 0897 Deidre & Floyd (h)
505 832 2699 Larry (h)
505 832 1427 HVAC - MH
505 991 0026 Mike (Nextel)
505 991 0027 Deidre (Nextel)
505 991 0028 Floyd (Nextel)
505 991 0029 Manolito (Nextel)
505 991 0025 Kate (Nextel)
505 780 0004 Extra 1 (p)
505 780 0002 Extra 2 (p)
505 660 9585 Mercedes - front seat
505 660 3976 Mercedes - back seat
505 660 6240 Mercedes G500 (jeep)
505 690 5480 JE Suburban
505 690 1821 99 Suburban
505 699 8055 Tahoe
505 670 9754 Hummer
505 765 1200 Bradbury Stamm (w)
505 842 5419 Bradbury Stamm (f)
505 466 2668 Tom Pascuzzi (doctor) (p)
505 834 2238 Stables
505 699 7301 Karen (Cell)
505 832 2676 Office Fax

Healy, Shannon
Zorro Ranch
107 Camino Cabo
Santa Fe, NM 87508
505 466 2668(h)
505 690 1683(p)
570 454 8081 Mom (Cheryl)
516 331 6339 Dad

Kelly, John
Attorney General
3510 Wollers Place, N.E.
Albuguerque, New Mexico 87106
505 848 1867 (w)
505-768-1529
(Hm)500 Fourth Street NW
Suite 1000
Albuquerque, NM 87103-2168
505-268-4508 (h)
505 235 5084 (p)
505 848 1889 (wf)

Kerney, Gary
Landmark National
2817 Crain Highway
Upper Marlboro, Maryland 20774
301-574-3330(w)
240 463 3237(p)
Email:
gkerney@landmarknational.
(Hm)292 Cape St. John
Annapolis, Maryland 21401
805 581 4173 (gson)
410 533 2485 Gary home
301-574-3301 (wf)
home 410-349-1778
240 463 3237 cellular
240 463 3236 Emergency

King, Bruce
Governor - New Mex

Suite 400
1120 Paseo De Peralta
Santa Fe, NM 87503
505-827-3020
505-827-3026
505-827-7300 Home
505-832-4239

King, Rhonda
Rhonda King Realty
Hwy 472
2.5 mi west of Stanley
P.O. Box 606
Stanley, New Mexico 87056
505-832-4603 Work
505-982-4289 Fax
505-832-4229 Home
505-250-0730 Portable

Massage - New Mexico
505-269-1755 Diana (p)
505-271-9532 Diana
505-989-3902 Laura Christianson
505-982-1176 Daniella Urbassek (German)
505 982 2283 Sabrina
505 660 6192 Sabrina
505 984 8358 Rachel
505 424 7416 Rachel
505 669 1269 Rachel
505 989 9846 Linda
Spankman-Yoga
505 471 1244 Melinda Walker - Reflexologist
505 984 8142 Sabina (German)
505 983 6742 Maureen (GM really likes)
505 989 4264 Stina - GM still to try
505 228 4505 Heidi (p)
505 438 3467 Nicki(Bill Siegel recommended)

Richardson, Bill
505 476-2200 o
505 944 7410 f
505 699 8222 (p)
505 476 2245 office direct
505 469 6881 Sec agent w/Gov (Tony)

Santa Fe Institute
1399 Hyde Park Road
Santa Fe, NM 87501
505-984-8800
505-982-0565

Singleton, Dr. & Mrs.
San Cristobal Ranch
Lamy, NM 87540
505-988-9720 (H)

RM

Aboff Shelley
001 407 333 2338
001561 333 9517

Cowley, Dick
0207-822 3691 (h)

Domb, Sam
230 Central Park South #18F
New York, NY

GIUFFRE0016

HOUSE_OVERSIGHT_014222

Hatsuhana (Japanese)
17 East 48th Street
0101 212 355 3345

Helmsley Palace
0101 212 888 7000

Il Cantinori
32 East 10 (at Broadway)

Il Tre Merli

Houston Street
West Broadway
691 7098

Isabelle's
359 Columbus Avenue
0101 212 724 2100

Jour et Nuit
212-925-5971

Karen Pets
1195 Lexington Ave.
b/w 81st & 82nd Sts.
212 472-9440

Klinger, Georgette
480 Madison Ave.
New York, NY 10021
212-838-3200
407-659-1522 Florida
Series #201482 Norma Jean

Le Club
88th (2-3)

Le Comptoir
227 East 67th Street
New York, NY 10021
212-794-4950

Lowell Hotel
Ruad Chartoun/an-contact
28 East 63rd St.
New York, NY
212-838-1400
212 319 4230

Madison Gourmet
212 288 8278(66)
212 737 3331 (84)

Madison Towers
22 E. 38th Street
(Corner of Madison & 38th)
3rd floor
New York, NY
001 212 685 7155

Madre, Le
158 West 18th
New York, NY
001 212 727 8022

Mark Hotel
New York, NY
212 744 4300

Massage - California
310 572 9693 Tracey
310-840-6989 Anastasia
310 396 0951 Danielle Schweitzer
310-450-1751 Rachel
714-841-1171 Lydia
310-392-2559 Scott Connelly
310-281-1270 Jackie Iverson
323-871-6829 Lisa Versaci
310 451 9694 Gypsy (h)
310 429 0254 Lori Bregman
310 463 6356 Jen (one of gypsy)
310-854-6366 Sports connection
310 463 5759 Sophie Biddle (p)
310 394 7048 Sophie Biddle
818-216-6974 Tiffany Gramza
323-270-7470 Tiffany Gramza (p)
310 394 1086 Scott Hobbs
323-254 8566 Marie Sabe (Courtney Love's)
818-618 6807 Marie (p)
310 458 0883 Amber
323 314 4043 Crissy (Lisa Sullivan;s friend
310 457 9388 Gypsy (w)
212 616 6948 NY # Gypsy (can leave vm)
323 572 1632 Chauntae Davis
323 866 9942 Marianna (p)
702 743 0620 p Gypsy(p)
310 880 3495 Tanya (Petrella's friend)
310 702 0169 Chauntae (p)
310 709 8877(p) Alex Zosman(Gara's friend)
310 709 8877 Elizabeth Zosman
310 435 3930 Christy Tharpe - Los Angeles

Mayfair Regent
65th bet Park/Mad
001 212 288 0800

McMullan, Patrick
Photographer
12 Fifth Avenue, #1-R
New York, N.Y. 10011
212-674-2153

Mercer Kitchen
99 Prince
001 212 966 5454
001 212 966 0010(f)

Morgan Hotel
001 212 686 0300

Mr Chow
324 E. 57th
New York
10022
212 751 9030
0207 589 7347
(Hm)151 Knightsbridge

GIUFFRE00166/
HOUSE_OVERSIGHT_014223

EXHBIT 3

Lynn & JoJo

① I sent Lucian & Rushia's mail to their correct address and called Post office to make sure all future mail will be sent to them.

② I Scheduled the cable company to come on Thursday. This is their soonest appointment. Ghislaine asked me to make an appointment because the TV in the Blue Room does not get a clear reception.

③ SHUTTER COMPANY WILL COME EARLY THURSDAY TO MEASURE SHUTTER NEXT TO GHISLAINE'S DESK.. THE SHUTTER WILL NOT ROLL DOWN.

* BOTH CABLE COMPANY & SHUTTER COMPANY WILL CALL ME ON MY CELL PHONE TO MAKE SURE JEFFREY & GHISLAINE ARE NOT HERE.

Jeffrey E. Epstein

Nicole

301.3101

SA02969

GIUFFRE001523

HOUSE_OVERSIGHT_014225

IMPORTANT MESSAGE

FOR JR Epstein

DATE 02/02/03 TIME 8:45 A.M. ~~P.M.~~

M. Ms BANU

OF

PHONE 310 498 3045
AREA CODE NUMBER EXTENSION

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL	✓	SPECIAL ATTENTION	

MESSAGE Could you Please call back, it's very important

SIGNED Evelyn

1184

IMPORTANT MESSAGE

FOR JE

DATE 01/02/03 TIME 16:30 A.M. P.M.

M. CAROLINE CASEY

OF

PHONE 889 3900
AREA CODE NUMBER EXTENSION

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED GM

1184

IMPORTANT MESSAGE

FOR GM

DATE TIME A.M. P.M.

M

OF

PHONE
AREA CODE NUMBER EXTENSION

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Tammy PHONED TO CONFIRM LOBBY

SIGNED

1184

IMPORTANT MESSAGE

FOR JE

DATE 01/02/03 TIME 21:06 A.M. P.M.

M. AMANDA

OF

PHONE 463 8470
AREA CODE NUMBER EXTENSION

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE WANTS TO KNOW IF SHE SHOULD BRING HER FRIEND HOLLY WITH TONIGHT

SAO01456

SIGNED

1184

GIUFFRE001427

IMPORTANT MESSAGE

FOR MR EPSTEIN
DATE 4/23/04 TIME 6:16 A.M. P.M.
M MARK EPSTEIN
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE AT YOUR HOME
SIGNED 1184

IMPORTANT MESSAGE

FOR MR MAXWELL
DATE 4/23/04 TIME 5:35 A.M. P.M.
M Helen
OF
PHONE/ MOBILE OFFICE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
SIGNED 1184

IMPORTANT MESSAGE

FOR MR EPSTEIN
DATE TIME A.M. P.M.
M MARK EPSTEIN
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	✓
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
SIGNED 1184

IMPORTANT MESSAGE

FOR MR MAXWELL
DATE 4/23/04 TIME 5:37 A.M. P.M.
M
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
SAO2827
SIGNED 1184

GIUFFRE001451

IMPORTANT MESSAGE

FOR 6M

DATE 4/28/04 TIME 2:00 A.M. P.M.

M Martha

OF Colonial Bank

PHONE/ MOBILE 653-3393

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR MS. MAXWELL

DATE 04/25/04 TIME 6:55 A.M. P.M.

M S. NECOLE HESSE

OF –

PHONE/ ~~MOBILE~~ 832 6777

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE RETURNIN YOUR CALL

SIGNED Rushi 1184

IMPORTANT MESSAGE

FOR

DATE TIME A.M. P.M.

M Amy Birse

OF

PHONE/ MOBILE 561-373-9042

TELEPHONED		PLEASE CALL	X
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey

DATE TIME A.M. P.M.

M Ghislaine

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE would be helpful to have [illegible] come to Palm Beach today to stay here and help train new staff with Ghislaine

SA02830

SIGNED

GIUFFRE001454

IMPORTANT MESSAGE

FOR 05/21/04
DATE FOR MR EPSTEIN TIME 5.37 A.M. P.M.
M JERRY GOLDSMITH
OF
PHONE/ MOBILE 561 844 9715

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "PLEASE CALL ME"

SIGNED 1184

IMPORTANT MESSAGE

FOR MR EPSTEIN
DATE TIME 8.30 A.M. P.M.
M SARAH
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE WILL CALL BACK

SIGNED 1184

IMPORTANT MESSAGE

FOR MR EPSTEIN
DATE 05/21/04 TIME 4.38 A.M. P.M.
M JOHANNA FJOBERG
(561)
PHONE/ MOBILE 714 0546

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "CALLED"
"CALL BACK"

SIGNED 1184

IMPORTANT MESSAGE

FOR 05/21/04
DATE TO MR EPSTEIN TIME 12.45 A.M. P.M.
M
OF CHRIS CONDON (MS)
PHONE/ MOBILE BOT 2 561 301 2211

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE CALLED

SAO2833

SIGNED 1184

GIUFFRE001457

IMPORTANT MESSAGE

FOR Jeffrey

DATE _____ TIME _____ A.M. P.M.

M Ghislaine

OF called

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR 06/06/04

DATE FOR MR EPSTEIN TIME 7.44 A.M. ~~P.M.~~

M

OF MS. MAXWELL

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "CALLED BUT NOT VERY IMPORTENT"

SIGNED R 1184

IMPORTANT MESSAGE

FOR MR EPSTEIN

DATE 06/11/04 TIME 1.48 ~~A.M.~~ P.M.

M FRANCIS WARD

OF

PHONE/ MOBILE (561) 346 1715

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE 'CALL BACK'

SIGNED R 1184

IMPORTANT MESSAGE

FOR MR. EPSTEIN

DATE 6/6/04 TIME 8.57 A.M. ~~P.M.~~

M TONY

OF

PHONE/ MOBILE 790 5475

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "WILL BE COMING AT 11 AM TODAY

SAO2836

SIGNED 1184

GIUFFRE001460

IMPORTANT MESSAGE

FOR Tatum

DATE _____ TIME _____ A.M. P.M.

M _____

OF _____

PHONE/ MOBILE 577-5896

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE _____

SIGNED _____ 1184

IMPORTANT MESSAGE

FOR SARAH

DATE 6.12.2004 TIME 3.55 A.M. P.M.

M JO JO

OF _____

PHONE/ MOBILE 917 975 4500.

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE CALLED. SAYING SOME ONE CALLED FROM PALM BEACH

SIGNED _____ 1184

IMPORTANT MESSAGE

FOR Tatum

DATE _____ TIME _____ A.M. P.M.

M _____

OF _____

PHONE/ MOBILE _____

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She'll be here at 5.30

SIGNED _____ 1184

IMPORTANT MESSAGE

FOR Mr. Epstein

DATE _____ TIME _____ A.M. P.M.

M _____

OF Ms. Maxwell

PHONE/ MOBILE _____

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE _____

SA02837

SIGNED _____ 1184

GIUFFRE001461

IMPORTANT MESSAGE

FOR MR. EPSTEIN

DATE 7.9.2004 TIME 1.30 A.M. P.M.

M. SCHANZ

OF

PHONE/ MOBILE 516 791 0044

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE CALLED

SIGNED 1184

IMPORTANT MESSAGE

FOR [illegible]

DATE [illegible] TIME 2.45 A.M. P.M.

M IVAN ROSH

OF [illegible]

PHONE/ MOBILE 914-393-1225

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR SARAH

DATE 7/9/04 TIME 10.36 A.M. P.M.

M

OF LESLIE (NY OFFICE)

PHONE/ MOBILE 203 972 4488

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE SHE IS WORKING FROM HOME TODAY PL CALL THE ABOVE # ASAP

SIGNED R 1184

IMPORTANT MESSAGE

FOR MR. EPSTEIN

DATE [illegible] TIME 6.35 A.M. P.M.

M MAXWELL

OF DARREN

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE PLEASE CALL WHEN POSSIBLE

SAO2840

SIGNED 1184

GIUFFRE001464

IMPORTANT MESSAGE

FOR SARAH EIN
DATE 07/10/04 TIME 6.33 A.M. P.M.
M. SCHANZ
OF RAGHU
PHONE/ MOBILE 516 791 0044

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE PL CALL
(CILLY)

SIGNED 1184

IMPORTANT MESSAGE

FOR MR EPSTEIN
DATE TIME 9 A.M. P.M.
M. GEORGIA (OFFICE)
OF
PHONE/ MOBILE 917 759 7167 25

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR SARAH
DATE 7/9/04 TIME 10.31 A.M. P.M.
M. MILES
OF LESLIE (NY OFFICE)
PHONE/ MOBILE 203 472 4488

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE SHE IS WORKING
FROM HOME ALL DAY
PL REACH THE ABOVE
ASAP

SIGNED R 1184

IMPORTANT MESSAGE

FOR MR EPSTEIN
DATE 7/9/04 TIME 7.50 A.M. P.M.
M. MAXWELL E.
OF TATUM
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "BRITTNY IS
AVAILABLE ON TUESDAY
NO ONE FRI TOMORROW

SAO2841

SIGNED R 1184

GIUFFRE001465

IMPORTANT MESSAGE

FOR MR. EPSTEIN

DATE _____ TIME _____ A.M. P.M.

M _____

OF MS. MAXWELL

PHONE/ MOBILE _____

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE _____

SIGNED _____ 1184

IMPORTANT MESSAGE

FOR JE

DATE _____ TIME 7 A.M. P.M.

M _____

OF Brittany

PHONE/ MOBILE 662-3098

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She said if she can't come [illegible] before 4 or 5 [illegible] after 4 or 5 [illegible] b/c she has b-day dinner w/her grandfa.

SIGNED _____ 1184

IMPORTANT MESSAGE

FOR MR. EPSTEIN

DATE _____ TIME _____ A.M. P.M.

M _____

OF _____

PHONE/ MOBILE _____

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She will see you at 7.30

SIGNED _____ 1184

IMPORTANT MESSAGE

FOR MR. Epstein

DATE _____ TIME 2:18 A.M. P.M.

M Manuela

OF _____

PHONE/ MOBILE _____

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She said that Sophie and her messages said that she's sorry for not seeing you in California.

SAO01465

SIGNED _____ 1184

SC1184 (001)

GIUFFRE001436

IMPORTANT MESSAGE

FOR JEFFREY

DATE AUG 2 TIME 12:45 A.M. P.M.

M TATUM & RHIANNA

OF

PHONE/ MOBILE 201-2237

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE THEY ARE AVAILABLE ALL WEEKEND AND ~~[illegible]~~ MAYBE [illegible]

SIGNED Nicole Hesse

1184

IMPORTANT MESSAGE

FOR MR EPSTEIN

DATE 7/25/04 TIME 5:02 A.M. P.M.

M

OF SNYDER

PHONE/ MOBILE 914 763 9167

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "RETURNING YOUR CALL"

SIGNED

1184

IMPORTANT MESSAGE

FOR SARA

DATE Aug. 2 TIME 3:00 A.M. P.M.

M Nicole Hesse

OF

PHONE/ MOBILE [illegible]

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	✓

MESSAGE Please call in reference to [illegible] the phone. Please [illegible] I would [illegible] [illegible] Mr. Maxwell's [illegible].

SIGNED Nicole Hesse

1184

IMPORTANT MESSAGE

FOR MR. EPSTEIN

DATE 7/25/04 TIME 1:48 A.M. P.M.

M

OF MS MAXWELL

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "TELL HIM TO CALL ME"

SAO01464

SIGNED

1184

SC1184-1001

GIUFFRE001435

IMPORTANT MESSAGE

FOR Jo Jo
DATE 8/6/04 TIME 12:00 A.M. P.M.
M
OF Dave
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Arriving at Customs at 8:15
Need: 2 vehicles (5) people

SIGNED 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME 9:30 A.M. P.M.
M Nadia
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
will phone again in 1/2 hr.

SIGNED 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME A.M. P.M.
M
OF LVA
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	✓
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME 11:35 A.M. P.M.
M Aberbusman
OF
PHONE/ MOBILE 818 8162

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	X
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SAO2845

SIGNED 1184

GIUFFRE001469

IMPORTANT MESSAGE

FOR JE

DATE 20 AUG TIME 11.00 A.M. P.M.

M

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE CALLED.
SHE HAS ALL THE INFO
YOU NEED

CALL AT 631.537.9385

SIGNED Manu 1184

IMPORTANT MESSAGE

FOR JE

DATE 20 AUG TIME 3.00 A.M. P.M.

M

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Tesla

Call HER BACK

917. 503. 2296

SIGNED Manu 1184

IMPORTANT MESSAGE

FOR JE

DATE 20 AUG TIME 8.00 A.M. P.M.

M

OF Nathalie

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Returns your call

917. 204. 4676

SIGNED SAO2848 1184

IMPORTANT MESSAGE

FOR JE

DATE 20 AUG TIME 3.40 A.M. P.M.

M Elizabeth

OF

PHONE/ MOBILE ✓

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE SHE LET LARRY GO
THE ONLY FLIGHT TO PB leaves
at. 3.15
Not heard from Tom Ford...
If you call it means she will pick
up TF alone in the chapter.
If you want to change please
call GM back

SIGNED 1184

GIUFFRE001472

IMPORTANT MESSAGE

FOR ~~MR EPSTEIN~~
DATE ~~MR~~ TIME ~~2:45~~ A.M. P.M.
M
OF MS. MAXWELL
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR JE.
DATE TIME 9:00 A.M. P.M.
M Sarah
OF Brittany
PHONE/ MOBILE 662-3098

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She said if she can't [illegible] left [illegible] after 4:00 (6:00 or 7:00) b/cuz she has birthday dinner w/her grandfa

SIGNED 1184

IMPORTANT MESSAGE

FOR MR. EPSTEIN
DATE TIME A.M. P.M.
M Sophie Biddle
OF
PHONE/ MOBILE 310-462-5759

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE she will see you at 7:30

SIGNED 1184

IMPORTANT MESSAGE

FOR MR. Epstein
DATE TIME 2:48 A.M. P.M.
M Manuela
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She said that sophie got her messages & said that she's sorry for not seeing you in California.

SAO2850

SIGNED 1184

GIUFFRE001474

IMPORTANT MESSAGE

FOR Sarah
DATE 11-4-04 TIME 2:40 A.M. P.M.
M
OF
PHONE/ MOBILE 644 · 7226

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Return
Brittney's
Call

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 12-01-04 TIME 2:55 A.M. P.M.
M From Sarah
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Britney would like to work @ 4:00 pm if possible.
[is scheduled for 5:00 today]

SIGNED the 1184
movie is @ 7:30

IMPORTANT MESSAGE

FOR Sarah
DATE 12/6/04 TIME 1:00 A.M. P.M.
M
OF Britney
PHONE/ MOBILE (561) 965-6857

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her

SIGNED 1184

IMPORTANT MESSAGE

FOR Mr. J.E.
DATE 12/6/04 TIME 1:30 A.M. P.M.
M Mr. Harry Beller
OF
PHONE/ MOBILE (212) 750-1176

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Returning your
Call

SAO2939

SIGNED 1184

GIUFFRE001493

IMPORTANT MESSAGE

FOR Mr. J.E.
DATE 12/04/04 TIME 2:40 A.M. P.M.
M r Goldsmith
OF
PHONE/ MOBILE (772) 971-1000

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call him
SIGNED R
1184

IMPORTANT MESSAGE

FOR Mr. J.E.
DATE 12/04/04 TIME 4:20 A.M. P.M.
M s G. Maxwell
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her.
SIGNED R
1184

IMPORTANT MESSAGE

FOR Mr. J.E.
DATE 12/04/04 TIME 5:30 A.M. P.M.
M s G. Maxwell
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her
SIGNED R
1184

IMPORTANT MESSAGE

FOR Mr. J.E.
DATE 12/04/04 TIME 5:40 A.M. P.M.
M Solamnz
OF (561)
PHONE/ MOBILE 714-0546

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her
SAO2938
SIGNED R
1184

GIUFFRE001492

IMPORTANT MESSAGE

FOR SARAH
DATE 12/9/04 TIME 10:20 A.M. P.M.
M VOMAR
OF Consulting
PHONE/ MOBILE (954) 709-7356

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Scheduling for going thru Palm Beach House"

SIGNED R

1184

IMPORTANT MESSAGE

FOR Mr. J E
DATE 12/9/04 TIME 5:00 A.M. P.M.
Mr. Goldsmith
OF
PHONE/ MOBILE (772) 971-1000

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please Call him

SIGNED R

1184

IMPORTANT MESSAGE

FOR Mr. J E
DATE 12/09/04 TIME 8:30 A.M. P.M.
Ms Svetlana
OF
PHONE/ MOBILE (917) 774-3061

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE "Tell him that I Called"

SIGNED R

1184

IMPORTANT MESSAGE

FOR Mr. J E
DATE 12/09/04 TIME 8:00 A.M. P.M.
M rs Wexner
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please She will call back

SA02943

SIGNED R

1184

GIUFFRE001497

IMPORTANT MESSAGE

FOR J.E.

DATE 1.8.05 TIME 4:05 A.M. P.M.

M Amya

OF

PHONE/ MOBILE (818) 445-9879

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

'Please call me back'

SIGNED R

1184

IMPORTANT MESSAGE

FOR Jeffrey

DATE 01/08/05 TIME 10:1 A.M. P.M.

M Nadia

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

please call her

SIGNED

1184

IMPORTANT MESSAGE

FOR J.E

DATE 1.8.05 TIME 4:55 A.M. P.M.

M Coppo-field

OF Call (702) 235 5555

PHONE/ MOBILE (212) 753-6555

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

'Please call him'

SIGNED R

1184

IMPORTANT MESSAGE

FOR Jeffrey 9:30

DATE 01/04/05 TIME A.M. P.M.

M Jean Luc

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE ing if you would called him he has ~~sth for~~ some message for you

SAO2949

SIGNED

1184

GIUFFRE001503

IMPORTANT MESSAGE

FOR J. E

DATE 2/24/05 TIME 4:18 A.M. P.M.

M Katia

OF

PHONE/ MOBILE 011 55118383 4951

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please! Call her Tommorow is her birthday

SIGNED J.

1184

IMPORTANT MESSAGE

FOR J. E

DATE 2/22 TIME 12:45 A.M. P.M.

M Shana

OF

PHONE/ MOBILE (561) 689-4717

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please! Call her.

SIGNED J.

1184

IMPORTANT MESSAGE

FOR Jeffrey

DATE 2/25/05 TIME 01:10 A.M. P.M.

M Dum Bois

OF

PHONE/ MOBILE 914 552 4400

TELEPHONED		PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please call him Back

SIGNED

1184

IMPORTANT MESSAGE

FOR Mr. Epstein

DATE 2/24/05 TIME 11:19 A.M. P.M.

M Katia

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She needs Lem's telephone number. Left her # 917 - 678 - 2772

SIGNED LER

1184

SAO2967

GIUFFRE001521

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/25/05 TIME 1:39 A.M. ~~P.M.~~
M Christaine
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Tried the called

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/25/05 TIME 8:42 ~~A.M.~~ P.M.
M
OF
PHONE/ MOBILE 561

TELEPHONED		PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
She would like to speak with you.

SIGNED 1184

IMPORTANT MESSAGE

FOR
DATE TIME A.M. P.M.
M
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/25/05 TIME 12/2 A.M. P.M.
M
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

SAO2998

GIUFFRE001553

IMPORTANT MESSAGE

FOR Jeffrey
DATE 02/26/05 TIME 11:15 A.M. P.M.
M Dana
OF
PHONE/ MOBILE 750 802 4061

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her back in 16.30
She is on the way to the gym

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 02/25/05 TIME 05:30 A.M. P.M.
M Ken-Lee
OF
PHONE/ MOBILE You have it

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Going back to Connecticut...
what about Paris on Saturday

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/26/05 TIME 12:40 A.M. P.M.
M Sandra
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/26/05 TIME 12:21 A.M. P.M.
M Anice
OF
PHONE/ MOBILE 646 436 9784

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her back

SIGNED 1184

SAO2968

GIUFFRE001522

IMPORTANT MESSAGE

FOR J. E.

DATE 2/27/05 TIME 10:18 A.M. P.M.

M

OF Ms. Maxwell

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She is home

SIGNED J.

1184

IMPORTANT MESSAGE

FOR J. E.

DATE 2/26/05 TIME 4:40 A.M. P.M.

M Geon Luc

OF

PHONE/ MOBILE no phone #

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please!

Call him

SIGNED J.

1184

IMPORTANT MESSAGE

FOR Jeffrey

DATE 2/28/05 TIME 12:30 A.M. P.M.

M

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She is non during if 2:30 is ok we are words to stay in school

IMPORTANT MESSAGE

FOR Jeffrey

DATE 2/27/05 TIME 07:45 A.M. P.M.

M Geon Luc

OF

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE That he will b back

SAO01067

GIUFFRE001388

HOUSE_OVERSIGHT_014246

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/28/05 TIME 12:17 A.M. P.M.
M Darren
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE He needs to speak with you.

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/28/05 TIME 12:10 A.M. P.M.
M Lawrence Krauss
OF
PHONE/ MOBILE 216 970 3496

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE He has sent you some faxes that he would like follow up.

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/28/05 TIME 5:30 A.M. P.M.
M Christine
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Pls. call back

SIGNED

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/27/05 TIME 11:20 A.M. P.M.
M Sarah.
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please call her back. She wanted make sure you know that she is going to meet Ghislaine and go with her to the Ranch

SIGNED 1184

SAO3000

GIUFFRE001555

IMPORTANT MESSAGE

FOR Jeffrey
DATE _____ TIME 6:05 A.M. P.M.
M _____
OF NATALIE
PHONE/ MOBILE _____

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Call back

SIGNED Nadia 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 2/28/05 TIME 7:11 A.M. P.M.
M Natalie
OF _____
PHONE/ MOBILE 917 204 9896

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Barbara is away. Back on Wensday and she might have sth on Friday

SIGNED _____ 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 02/28/05 TIME 7:56 A.M. P.M.
M Teala
OF _____
PHONE/ MOBILE 917 603 2296

TELEPHONED		PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE That she called please call her back

IMPORTANT MESSAGE

FOR Ghislaine
DATE 02/28/05 TIME 7:50 A.M. P.M.
M Ghislaine
OF _____
PHONE/ MOBILE _____

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please call back

SAO3001

GIUFFRE001556

IMPORTANT MESSAGE

FOR Jeffrey
DATE 3/5/05 TIME 12:20 A.M. P.M.
M Ghislaine
OF
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Tecno still doesn't answer the phone.

SIGNED AM

1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 3/1/05 TIME 10:20 A.M. P.M.
M Cecilia
OF
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She had on the phone. Mr. Harvey Weinstein

SIGNED

1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 3/5/05 TIME 12:22 A.M. P.M.
M Christina
OF
PHONE/ MOBILE 561 389 6874

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She has problems with car... could she be here at 2 pm?

SIGNED

IMPORTANT MESSAGE

FOR Jeffrey
DATE 3/5/05 TIME 11:50 A.M. P.M.
M Larry Visoski
OF
PHONE/ MOBILE 917 868 6195

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Person for the car will be here in 15 min. to drop off foam and papers

SIGNED

1184

SA03002

GIUFFRE001557

IMPORTANT MESSAGE

FOR Jeffrey
DATE 3/6/05 TIME 03:00 A.M. P.M.
M Mort Zuckerman
OF
PHONE/ MOBILE 917 7501900

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Returning your phone call

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 3/06/05 TIME 11:40 A.M. P.M.
M Glen
OF
PHONE/ MOBILE 914 669 4651

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE That he call Deal

SIGNED 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 3/7/05 TIME 7:30 A.M. P.M.
M Dr. Moskowitz
OF office
PHONE/ MOBILE 833-6116

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Do you want to see him?

SIGNED J. 1184

IMPORTANT MESSAGE

FOR Ms. G. Maxwell
DATE 3/06/05 TIME 9:01 A.M. P.M.
M Bruce
OF From The Island
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Left his cell #

340-771-1339

SAO01071

SIGNED 1184

GIUFFRE001392

HOUSE_OVERSIGHT_014250

IMPORTANT MESSAGE

FOR Sarah
DATE 3/20/05 TIME 1:10 A.M. P.M.
M Haley
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Left her cell #
308-0282

SIGNED X

1184

IMPORTANT MESSAGE

FOR J.E.
DATE 3/18/05 TIME 8:05 A.M. P.M.
M Jeff Staly
OF (212) 744-0770
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J.

1184

IMPORTANT MESSAGE

FOR Ms. B. Maxwell
DATE 3/19/05 TIME 3:45 A.M. P.M.
M Emi
OF Spa The Breakers
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Appointment is at 9:30am tomorrow. Christine is not available if it's okay to have another person.

SIGNED

IMPORTANT MESSAGE

FOR J.E.
DATE 3/18/05 TIME 12:55 A.M. P.M.
M Sarah
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SAO01474

SIGNED T

SC1164 1001

GIUFFRE001446

IMPORTANT MESSAGE

FOR Jeffrey
DATE 04/01/05 TIME 12:20 A.M. P.M.
M Ghislaine
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Glen has pulled muscle and he is at the hospital "Good Sam" They have called Dr. Moskowitz and everything has been organized. In this case probably they won't make for lunch.

SIGNED 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 3/31/05 TIME 7:05 A.M. P.M.
M Leslie Wexler
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J. 1184

#16

IMPORTANT MESSAGE

FOR Jeffrey
DATE 04/01/05 TIME 11:07 A.M. P.M.
M Cecilia
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She had on the phone Mr. Cipriani

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey Scow
DATE 04/1/05 TIME 07:5 A.M. P.M.
M Genia
OF
PHONE/ MOBILE No number he will call back

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE That he called

SIGNED 1184

SAO2972

GIUFFRE001526

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/9/05 TIME 02:10 A.M. P.M.
M Christaine
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	X
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/9/05 TIME 12:04 A.M. P.M.
M
OF
PHONE/ MOBILE 561

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR J.E
DATE 4/10/05 TIME 1:20 A.M. P.M.
M Dana
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
She went runing
and back to the gym

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J.E.
DATE 4/10/05 TIME A.M. P.M.
M Dana
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
She went running

SIGNED 1184

SAO2975

GIUFFRE001530

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/9/05 TIME 4:40 A.M. P.M.
M
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She is waiting for her friend to call her back. She would like to speak with you

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/9/05 TIME A.M. P.M.
M
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/11/05 TIME 11:40 A.M. P.M.
M Melisa Manes
OF
PHONE/ MOBILE 351 0944

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/9/05 TIME 1:05 A.M. P.M.
M Ghislaine
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please call her back

SIGNED

SAO3013

GIUFFRE001568

IMPORTANT MESSAGE

FOR J. E.
DATE 5/9/05 TIME 3:05 A.M. P.M.
M. Kaytana
OF (212) 645-7741
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 5/9/05 TIME 3:06 A.M. P.M.
M. Joana
OF 714-0546
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J. 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME 4:45 A.M. P.M.
M. Nadia –
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Thank you –

SIGNED 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME 12:15 A.M. P.M.
M. Les Wexner
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL	X	SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

SAO2980

GIUFFRE001535

IMPORTANT MESSAGE

FOR

DATE 5/24/05 TIME 9:10 A.M. P.M.

M. Eva

OF

PHONE/ MOBILE call her at home

TELEPHONED		PLEASE CALL	X
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED

1184

IMPORTANT MESSAGE

FOR J. E

DATE 5/9/05 TIME 7:20 A.M. P.M.

M. Mrs Maxwell

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J

1184

IMPORTANT MESSAGE

FOR JE

DATE TIME 12 A.M. P.M.

M. Danielle

OF

PHONE/ MOBILE 646 226 1463

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED

IMPORTANT MESSAGE

FOR JE

DATE TIME 10:25 A.M. P.M.

M. Nadia

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL	X	SPECIAL ATTENTION	

MESSAGE She got there safe

SIGNED

SA02981

GIUFFRE001536

IMPORTANT MESSAGE

FOR Jeffrey
DATE 04/01/05 TIME 12:20 A.M. P.M.
M Ghislaine
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Glen has pulled musle and he is at the hospital "Good Sam" They have called dr. Moskowitz and everything has been organized. In this case propably they won't make for lunch.

SIGNED 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 3/31/05 TIME 7:05 A.M. P.M.
M Leslie Wexler
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J. 1184

#16

IMPORTANT MESSAGE

FOR Jeffrey
DATE 04/01/05 TIME 11:07 A.M. P.M.
M Cecilia
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She had on the phone Mr. Cipriani

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey Moscow
DATE ~~03/30/05~~ 04/1/05 TIME 07:5 A.M. P.M.
M Genia
OF
PHONE/ MOBILE No number he is ill call back

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE That he called

SIGNED 1184

SAO2983

GIUFFRE001538

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/9/05 TIME 02:10 A.M. P.M.
M Ghislaine
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	X
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey
DATE 4/9/05 TIME 12:04 A.M. P.M.
M [illegible]
OF
PHONE/ MOBILE 561 [illegible]

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
SIGNED 1184

IMPORTANT MESSAGE

FOR J.E
DATE 4/10/05 TIME 1:20 A.M. P.M.
M Dana
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
She went runing
and back to the gym
SIGNED J. 1184

IMPORTANT MESSAGE

FOR J.E.
DATE 4/10/05 TIME A.M. P.M.
M Dana
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
She went running
SIGNED 1184

SA02986

GIUFFRE001541

IMPORTANT MESSAGE

FOR J. E.
DATE 5/9/05 TIME 3:05 A.M. P.M.
M Kaytana
OF (212) 645-7741
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J.

1184

IMPORTANT MESSAGE

FOR J. E.
DATE 5/9/05 TIME 3:06 A.M. P.M.
M Joana
OF 714-0546
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J.

1184

IMPORTANT MESSAGE

FOR JE
DATE TIME 4:45 A.M. P.M.
M Nadia -
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Thank you -

SIGNED

IMPORTANT MESSAGE

FOR JE
DATE TIME 12:15 A.M. P.M.
M Les Wexner
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL	X	SPECIAL ATTENTION	

MESSAGE

1184

SAO2990

GIUFFRE001545

IMPORTANT MESSAGE

FOR J

DATE 5/24/05 TIME 9:10 A.M. P.M.

M. Eva

OF

PHONE/ MOBILE call her at home

TELEPHONED		PLEASE CALL	X
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR J. E

DATE 5/9/05 TIME 7:20 A.M. P.M.

M. Mrs Maxwell

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J 1184

IMPORTANT MESSAGE

FOR JE

DATE TIME 12 A.M. P.M.

M. Danielle

OF

PHONE/ MOBILE 6466226 1403

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR JE

DATE TIME 10.25 A.M. P.M.

M. Nadia

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL	X	SPECIAL ATTENTION	

MESSAGE She got there safe

SIGNED 1184

SAO2991

GIUFFRE001546

IMPORTANT MESSAGE

FOR Sarah

DATE 6-18-05 TIME 3:10 A.M. P.M.

M Heather

OF

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	✓
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR J. E.

DATE 6/13/05 TIME 10:58 A.M. P.M.

M G. M.

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Please. Call her back

SIGNED 1184

IMPORTANT MESSAGE

FOR Jeffrey

DATE 06/2/05 TIME 12:05 A.M. P.M.

M Jeffry Goldsmith

OF

PHONE/ MOBILE 772

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED 1184

IMPORTANT MESSAGE

FOR Mr. J. Epstein

DATE 6/11/05 TIME 12:05 A.M. P.M.

M Coleen

OF

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL	✓	SPECIAL ATTENTION	

MESSAGE

SAO01078

SIGNED 1184

GIUFFRE001399

IMPORTANT MESSAGE

FOR J.E.
DATE 7/4/05 TIME 6:25 A.M. P.M.
M
OF G. M.
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
SIGNED J. 1184

IMPORTANT MESSAGE

FOR J.E.
DATE 7/4/05 TIME 7:20 A.M. P.M.
M Tatiana
OF
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
SIGNED T 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME 12:30 A.M. P.M.
M G-
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She called Eduardo - She's going to have dinner w/ him - He's not going to Grand Prix - but he told her to call his secretary to organize passes -
SIGNED 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME 10:35 A.M. P.M.
M Tatyana
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Called to say goodnight
SAO01081
SIGNED 1184

GIUFFRE001402

IMPORTANT MESSAGE

FOR J. E.

DATE 8/19/05 TIME _____ A.M. P.M.

M Cecilia

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Remanid you about conference call at 9 AM

SIGNED J

1184

IMPORTANT MESSAGE

FOR Jeffrey

DATE 25/07/05 TIME 11:45 A.M. P.M.

M from Werner office

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Jim Lucas the head of the text department has answer on aircraft His number is 614 415 1078

SIGNED

1184

IMPORTANT MESSAGE

FOR JE

DATE _____ TIME _____ A.M. P.M.

M

OF Joanna

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She doesn't want to come to the movies, but call her if you want a massage before or after the movie.

SIGNED

1184

IMPORTANT MESSAGE

FOR JE

DATE _____ TIME 9a A.M. P.M.

M G

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She's at 71st please call

SAO01084

SIGNED

1184

GIUFFRE001405

IMPORTANT MESSAGE

FOR J.E.

DATE 8/19/05 TIME 4:12 A.M. P.M.

M G.M.

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She left message on answering machine.

SIGNED J. 1184

IMPORTANT MESSAGE

FOR 8/19/05 7:50 A.M. P.M.

DATE Adriana TIME

M

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Jeffrey to get information Where he has to go to Hampton and how to meet this person? He can be reach on Tatiana cellphone

J

SIGNED 1184

IMPORTANT MESSAGE

FOR JE

DATE TIME A.M. P.M.

M

OF Savoh

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Can Gloria Butney work on Sunday @ 4.00 and @ 4.30

SIGNED 1184

IMPORTANT MESSAGE

FOR 8/19/05 7:55 A.M. P.M.

DATE Adriana TIME

M

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Will be here tommorow at 11:00 AM

SAO01085

J

SIGNED 1184

GIUFFRE001406

IMPORTANT MESSAGE

FOR J.E

DATE 9/3/05 TIME 8:50 A.M. P.M.

M Adriana

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE I left message for Ashley to confirm for 11:00 AM and Vanessa for 4:30 PM

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J.E.

DATE 8/22/05 TIME 9:20 A.M. P.M.

M Nicole

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J.E

DATE 9/4/05 TIME 12:55 A.M. P.M.

M Brittney

OF

PHONE/ MOBILE 662-3093

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She would like to reschedule her time

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J.E.

DATE 8/22/05 TIME A.M. P.M.

M G M

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SA001477

SIGNED J. 1184

SC184 10/01

GIUFFRE001449

IMPORTANT MESSAGE

FOR Mr. J. Epstein
DATE 8/23/05 TIME 2:18 A.M. P.M.
M Alicia
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED L 1184

IMPORTANT MESSAGE

FOR
DATE TIME A.M. P.M.
M
OF Sarah
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Call her back, please

SIGNED 1184

IMPORTANT MESSAGE

FOR Mr. J. Epstein
DATE 8/22 TIME 4:21 A.M. P.M.
M Alicia
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call her.

SIGNED L 1184

IMPORTANT MESSAGE

FOR Mr. J Epstein
DATE 8/21 TIME 11:39 A.M. P.M.
M Nadia
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Mr. J. cannot work today. Ms. Brittany will be here at 2:00 pm.

SAO01449

SIGNED 1184

GIUFFRE001420

IMPORTANT MESSAGE

FOR

DATE TIME A.M. P.M.

M

OF NADIA

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
I went to a store to buy food
I will be back @ 5:00

SIGNED 1184

IMPORTANT MESSAGE

FOR JE

DATE TIME A.M. P.M.

M

OF Adriana

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Christina & . . . , are confirmed

SIGNED 1184

IMPORTANT MESSAGE

FOR JE

DATE TIME A.M. P.M.

M

OF Jenny

PHONE/ MOBILE 917 330 1033

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Please call back

SIGNED 1184

IMPORTANT MESSAGE

FOR

DATE TIME A.M. P.M.

1:00

M

OF NADIA

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
The movie starts @ 7.15

SAO01086

SIGNED 1184

GIUFFRE001407

IMPORTANT MESSAGE

FOR J. E.

DATE 9/4/05 TIME 3:40 A.M. P.M.

M

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J.

1184

IMPORTANT MESSAGE

FOR Ms. G. Maxwell

DATE 9/4/05 TIME 1:40 A.M. P.M.

M Coleen

OF

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE She will be here at 3 p.m. with Somebody.

SIGNED L.

1184

IMPORTANT MESSAGE

FOR J. E.

DATE 9/4/05 TIME 7:25 A.M. P.M.

M Adriana

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Canceled Julie. She would like to speak to you. I belive about college - 561.801.3590

Shoul I schedule any one else?

SIGNED J.

1184

IMPORTANT MESSAGE

FOR Mr. J. Epstein

DATE 9/4/05 TIME 2:08 A.M. P.M.

M

OF

PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SAO01089

SIGNED L

1184

GIUFFRE001409

HOUSE_OVERSIGHT_014268

IMPORTANT MESSAGE

FOR J.E.

DATE 9/10/05 TIME 11:16 A.M. P.M.

M G.M.

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Dana Burns got invitation

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J.E.

DATE 9/5/05 TIME 10:25 A.M. P.M.

M Brittney

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE 5:00 PM is O.K. with her

SIGNED T. 1184

IMPORTANT MESSAGE

FOR J.E.

DATE 9/10/05 TIME 11:16 A.M. P.M.

M G.M.

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Dana Burns got an invitation

SIGNED J 1184

IMPORTANT MESSAGE

FOR J.E.

DATE 9/8/05 TIME 4:50 A.M. P.M.

M Tatum

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Her new phone # 574-8400

SAO01090

SIGNED J. 1184

GIUFFRE001410

IMPORTANT MESSAGE

FOR J. E.

DATE 9/10/05 TIME 12:50 A.M. P.M.

M Celina

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Call her in North Salem

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J. E.

DATE 9/10/05 TIME 11:16 A.M. P.M.

M G. M.

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Dana Burns decline invitation

SIGNED J 1184

IMPORTANT MESSAGE

FOR J.E

DATE TIME A.M. P.M.

M DANA

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE RETURNING YOUR CALL @ 12 20'

SIGNED 1184

IMPORTANT MESSAGE

FOR J. E.

DATE 9/10/05 TIME 1:15 A.M. P.M.

M Adriana

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Lauren confirm 4 PM

SAO01091

SIGNED J 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 9/11/05 TIME 9:15 A.M. P.M.
M Adriana
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE I got a car for ...

SIGNED J. 1184

IMPORTANT MESSAGE

FOR JE
DATE TIME A.M. P.M.
M
OF N
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Adriana hasn't continued Juliet @ 11.00 yet so she is keeping Britney on hold in case Julie doesn't call back

SIGNED 1184

IMPORTANT MESSAGE

FOR Mr. J. Epstein
DATE 9/11/05 TIME 10:01 A.M. P.M.
M George Goldsmith
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED L 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 9/10/05 TIME 10:10 A.M. P.M.
M Adriana
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Julie will be at 11:AM
Do you want me to cancel Britney

SAO01093

SIGNED J. 1184

GIUFFRE001413

FROM T.

IMPORTANT MESSAGE

FOR J. E.

DATE 10/1/05 TIME 2:30 A.M. P.M.

M Nadia

OF

PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED T

1184

IMPORTANT MESSAGE

FOR J. E

DATE 10/1/05 TIME 9:30 A.M. P.M.

M Sarah

OF

PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

[illegible] continue

at 11 AM

and [illegible] - 4 PM

SIGNED J

1184

IMPORTANT MESSAGE

FOR J. E.

DATE 10/1/05 TIME 7:10 A.M. P.M.

M John Brockman

OF

PHONE/ MOBILE (212) 595-0208

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED T

1184

IMPORTANT MESSAGE

FOR J. E.

DATE 10/1/05 TIME 10:15 A.M. P.M.

M Tatum

OF

PHONE/ MOBILE 574-0400

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SAO01469

SIGNED T.

1184

GIUFFRE001441

IMPORTANT MESSAGE

FOR J. E.
DATE 10/2/05 TIME 10:40 A.M. P.M.
M Sarah
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Julie is sick and she can't come today

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 10/1/05 TIME 7:20 A.M. P.M.
M Jerry Goldsmith
OF
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J. 1184

IMPORTANT MESSAGE

FOR Mr. J. Epstein
DATE Oct. 2. 05 TIME 12:30 A.M. P.M.
M Tatum
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

574-0400 (501)

SIGNED L 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 10/2/05 TIME 10:20 A.M. P.M.
M Julie
OF 301-3590
PHONE/ MOBILE

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SAO01470

SIGNED J. 1184

IMPORTANT MESSAGE

FOR J. E.
DATE 10/3/05 TIME 2:50 A.M. P.M.
M Tila
OF
PHONE/ MOBILE (917) 603-2236

TELEPHONED	X	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SIGNED J

1184

IMPORTANT MESSAGE

FOR J. E.
DATE 10/2/05 TIME 3:05 A.M. P.M.
M Sandy Berger
OF
PHONE/ MOBILE (516) 759-2661

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE
Can you call him at this # between 10:00 - 10:30 PM

SIGNED J

1184

IMPORTANT MESSAGE

FOR J. E.
DATE 10/3/05 TIME 4:10 A.M. P.M.
M Sarah
OF
PHONE/ MOBILE

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE Ashley will be 1/2 hour late

IMPORTANT MESSAGE

FOR Mr. J. Epstein
DATE 10-2-05 TIME 12:30 A.M. P.M.
M Natalie
OF
PHONE/ MOBILE

TELEPHONED	✓	PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

SAO01471

GIUFFRE001443

EXHIBIT 4

IL' Villaggio 1455 Ocean Dr. Apt 811

Gretta 9AM Aventura limo

[redacted] is back in PB 714-0546

Gretchen 8C (Friends Apt?)

~~Tammy~~ (other Book?)

Pinto

Bard

Tammy (Port St)

Courtney W. (FRIDAY)

* ADventure Limousine Service
PO BOX 80-0146 Fed ID 65-0376225
adventura, FL 33280 [redacted]

6/19/05

Forward to Sara. trip 6/20/05 9:00 AM Military

[redacted] 1455 ocean DR. South Beach 811

358 EL BRILLO.

Puta-in miami [redacted]

[redacted] Work-9 00AM Tammy @ office

[redacted] to LSJ Thursday

yes to go!

HOUSE_OVERSIGHT_014276

[redacted] 3:30 Improv

Shauna colleen

? Miss Sarah - would you like to go running with me. Miss Dana

Dawn - Ballet
Greta - [redacted]

Natalya
[redacted]

Craig taFoya
[redacted] (h)
(o)

In From California 3pm
[redacted]

EMERGENCY 911

ALARM SYSTEM	Benham (Joe Technician)	1-800-940-4112 954-578-1990
FIRE RESCUE		(561) 838-5422
HOSPITAL	Good Samaritan Hospital 1309 North Flagler Drive West Palm Beach, FL 33401	(561) 650-6201
POISON		(561) 838-5422
POLICE		(561) 471-2000
VETERINARIAN	Island Animal Hospital 262 Sunset Avenue Palm Beach, FL 33480	(561) 833-8552
MIKE PEZZULO	Neighbouring House Manager who can be called in emergencies	(561) 854-9192 Disconnected
MS MAXWELL	Portable Home	(917) 520-3106 (212) 879-9366
JONITHA MACKENZIE	Portable Home	(917) 601-4143 (212) 535-7974

HOUSE_OVERSIGHT_014278

WORTH BUILDERS - [redacted]

116 East 65th Street
New York NY 10021

Ms Ghislaine Maxwell

Staff

Michelle Campos
Jennifer

House Managers
Joseph & Florena Rueda
Joseph
Florena

358 El Brillo Way, Palm Beach
Florida 33480

Mr. Jeffrey Epstein

Ms Ghislaine Maxwell

Staff
~~Lucian & Rushi McHawa~~

[redacted]

Jerome Pierre (Gardner) M- F

Alan Stopeck Landscape designer, Checks the garden

Francis & Pastora House cleaning service
Francis Peadon handles all cleaning/laundry
Bill Peadon

Nicole Hessey

Cherie Lynch

[redacted]

Nicole and Cherrie are well versed in supervising and shopping for PB, when necessary

Pilots

Larry Visosky

David Rogers

Dave

Car phones
Black Mercedes 600

Black Suburban
Mercedes Sports Convertible

[redacted]

HOUSE_OVERSIGHT_014279

Residences

Zorro Ranch
49, Zorro Ranch Road,
Stanley, New Mexico 87056

Mr. Jeffrey Epstein

Ms Ghislaine Maxwell

Staff
Office

Brice & Karen Gordon Home
Brice
Karen

Floyd & Deire Home

Manolito
Little St. James
C/0 Financial Trust Company
6100, Red Hook Quarters, Suite B3,
St. Thomas, USV1 00802.

Mr. Jeffrey Epstein

Ms. Ghislaine Maxwell

Staff

Miles & Cathy Alexander
Miles
Cathy
Paris
22 Avenue, Foch, Apt 2DD,
Paris, France 75116.
Tel: 011 331 441 70210
Fax: 011 331 441 70211
Staff
Valdson Cotrin

London
44 Kinnerton Street
London SW1X8ES
Tel: 011 44 207 838 9129
Fax: 011 44 207 838 9128
Staff
Kathie Orchard

HOUSE_OVERSIGHT_014280

6/20/05

Flight Safety Client - LARRY Visoski - Hyperion

Jenny 5:30-10:30

Key scan - door key

340-776-4912

212-750-2408

Tah? 6624199

Dr. Jarecki message

~~Cebra~~ Cecilia "called twice" 2:45PM + 3PM

email ↗ Maer Roshan <mroshan@radarmagazine.com>

< cecilia Steen @gmail.com

Message print out - 917-346-9154 Diana Cook

Dr. Nagrani (212) 688-1090

For Gstislaine Maxwell > Louella's cell phone (LeNoulin) 561-818-8961

561-752-6380

707-4985

ADRIANA'S PARENTS ARE GOING to the embassy on the 23rd

letter - J. epstein + co.

The Villard House

457 MADISON AVENUE 4th Floor

NY NY 10022

SARAH Kellen - 116 A EAST 65th ST

NY NY 10021 917-855-3363

04-31-05
#2 Tri - 972 3527 1080 (h)
972 544 986 337 (p)

- ~~[illegible]~~ Marcela 917-699 8496
NEW YORK AT&T Wireless, Inc

- Patricia Velasquez

Kelly Bruno
310 722 9948

Christie Get rid of code Mum
33 620 72 40 63

510 813 2533 Christie

212-517 9330 Johnnie Fisher
VERIZON NEW YORK, INC.

Ghislaine Maxwell

HOUSE_OVERSIGHT_014282

EXHIBIT 5

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

CASE: 15-cv-07433-RWS

VIRGINIA GIUFFRE,

Plaintiff,

v.

GHISLAINE MAXWELL,

Defendant.
_____/

VIDEOTAPED DEPOSITION OF TONY FIGUEROA

Volume 1 of 2

Pages 1 - 157

Taken at the Instance of the Defendant

DATE: Tuesday, June 28, 2016

TIME: Commenced: 8:59 a.m.
Concluded: 1:22 p.m.

PLACE: Southern Reporting Company
B. Paul Katz Professional Center
(SunTrust Building)
One Florida Park Drive South
Suite 214
Palm Coast, Florida 32137

REPORTED BY: LEANNE W. FITZGERALD, FPR
Florida Professional Reporter
Court Reporter and Notary Public

APPEARANCE OF COUNSEL

ON BEHALF OF THE PLAINTIFF:
BRADLEY J. EDWARDS, Esquire
Farmer, Jaffe, Weissing, Edwards, Fistos & Lehrman, P.L.
425 North Andrews Avenue
Ft. Lauderdale, Florida 33301
954-524-2820
Brad@pathtojustice.com

ON BEHALF OF THE DEFENDANT:
LAURA A. MENNINGER, Esquire
Haddon, Morgan and Foreman, P.C.
150 East 10th Avenue
Denver, Colorado 80203
303-831-7364
Lmenninger@hmflaw.com; Nsimmons@hmflaw.com

Also appearing: Jenny Martin, Videographer from Abel
Virginia Giuffre, Plaintiff

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STIPULATION

It is hereby stipulated and agreed by and between counsel present at this deposition and by the deponent that the witness review of this deposition would be waived.

INDEX OF EXHIBITS

(MARKED BY THE DEFENDANT:)

Defendant's Exhibit 1 42
(Palm Beach County Sheriff's Reports - Case Number 98041883)

Defendant's Exhibit 2 71
(Greenacres Reports)

Defendant's Exhibit 3 77
(Two Pictures of Apartment Building)

Defendant's Exhibit 4 83
(Palm Beach County Sheriff's Reports - Case Number 02075321)

Defendant's Exhibit 5 134
(Royal Palm Beach Police Reports)

Defendant's Exhibit 6 144
(Robert's School Records)

(MARKED BY THE PLAINTIFF:)

Plaintiff's Exhibit 1 162
(Photos)

Plaintiff's Exhibit 2 163
(Passport)

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A No. That was it.
Q Where were you living at the time she left?
A My parents' house.
Q Is that where you were making the phone calls?
A Yeah.
Q Is that how you remember it?
A Yep.
Q Were your parents happy about the phone bill?
A Well, they did not care, because they knew that Jeffrey had money. And I told them -- I was, like, "Well, he's going to be paying the bills, so don't worry about."
And they were, like, "All right. As long as it gets paid."
And it didn't get paid. And I didn't have a place to live, and so...
Q Did you ever try to get money from Jeffrey to pay the phone bills?
A No. Pretty much the only time I had ever talked to Jeffrey after that was mainly the conversations are, "Where is Virginia? I know you know where she's at."

Page 58

I'm, like, "No, dude, I don't. You're the one that (descriptive sound) sent her away, not me. I have no clue. I have not heard from her. You're the reason she's not here, so why are you even coming to me? How would I know? She left me. She did not leave some guy I knew, she left me." You know.
Q How did those conversation happen?
A Because he would just call me. He was just trying to find her. He was, like, hunting her down.
Q He called you on your phone?
A Uh-huh (affirmative). He had my number.
Q Your cell phone?
A It was -- I believe so. A cell phone at the time, yeah.
Q Is that where you were getting all these expensive phone calls was your cell phone?
A No. I was using my parents' landline to make the calls.
Q Got it.
To call Thailand?
A Yeah.
Q But Jeffrey had your cell phone number?
A Yeah.

Page 59

Q And you were getting calls from Jeffrey on your cell phone --
A Yes.
Q -- asking where she was?
A Uh-huh (affirmative).
Q Did he say why he was trying to find her?
A No.
Q Was it him or someone else?
A No. It was him.
Q What was his tone when he was calling and asking for her?
A I don't want to say, like, desperate, but, like, you could tell it was, like, a sense of urgency, like he was kind of upset, like, you know, where the hell is she, kind of without saying it, you know. He was -- you could tell he was definitely on the hunt, trying to figure out where she was at.
Q Did you understand that he had paid for her trip to Thailand?
A Yeah.
Q Had she ever been to Thailand before?
A Not that I was aware of.
Q Did he know whether she had just left Thailand without a word?

Page 60

A I don't know what he thought. I guess he stopped hearing from her, as well.
Q Did he say that she called and said I'm getting married, and I'm never coming back?
A No. He kept asking me what was going on. I said, "Dude, I don't know. Like, if I knew, don't you think I would tell you? I mean, I have no reason to not tell you. She left me. Why would I hide anything?"
Q How did you know she had left you? She just didn't come back?
A Like I said, she had written me a note telling me she wasn't coming back.
Q So you're having a bunch of phone calls. And then all of the sudden you get a note saying, I'm not coming back?
A Yep.
Q During the phone calls, did she tell you she was breaking up with you?
A No.
Q Do you know the name of the rehab program where Philip and Ms. Roberts were together?
A No. Like I said, pretty much that whole period I was not there. Like, literally, no trace of me or her were anywhere near each other until,

HOUSE_OVERSIGHT_014285

EXHIBIT 6

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

CASE NO. 15-CV-07433-RWS

----------x

VIRGINIA L. GIUFFRE,

Plaintiff,

v.

GHISLAINE MAXWELL,

Defendant.

----------x

May 18, 2016
9:04 a.m.

C O N F I D E N T I A L

Deposition of [redacted], pursuant to notice, taken by Plaintiff, at the offices of Boies Schiller & Flexner, 401 Las Olas Boulevard, Fort Lauderdale, Florida, before Kelli Ann Willis, a Registered Professional Reporter, Certified Realtime Reporter and Notary Public within and for the State of Florida.

MAGNA
LEGAL SERVICES

1 that she was a daughter of one of his friends.
2 Q. But it was possible she was the school --
3 is it possible that the school she referred to was a
4 high school?
5 A. Yes.
6 Q. And what happened at that dinner, if
7 anything?
8 A. He did some magic tricks.
9 Q. Did you observe David Copperfield to be a
10 friend of Jeffrey Epstein's?
11 A. Yes.
12 Q. Did Copperfield ever discuss Jeffrey's
13 involvement with young girls with you?
14 A. He questioned me if I was aware that girls
15 were getting paid to find other girls.
16 Q. Did he tell you any of the specifics of
17 that?
18 A. No.
19 Q. Did he say whether they were teenagers or
20 anything along those lines?
21 A. He did not.
22 MS. MENNINGER: Objection, leading, calls
23 for hearsay.
24 BY MS. McCAWLEY:
25 Q. Did you ever hear or observe Jeffrey

1 talking on the phone about Frederic Fekkai?
2 A. Yes.
3 MS. MENNINGER: Objection, leading.
4 BY MS. McCAWLEY:
5 Q. What did you hear?
6 A. I heard him call someone, and say, Fekkai
7 is in Hawaii. Can we find some girls for him?
8 Q. And what was your reaction to that?
9 A. Well, I was massaging and I didn't have a
10 reaction. I tried to remain reactionless the whole
11 five years.
12 Q. Did Jeffrey ever take you shopping?
13 A. Yes.
14 Q. Can you describe for me what happened?
15 A. Sure. He took me to Victoria's Secret. I
16 believe he picked out everything and went into the
17 room with me, the fitting room, which was very odd.
18 Q. Did he make any comments about being in
19 the fitting room with you?
20 A. He joked that one time he was in there
21 with another girl, and she said something like
22 "Dad." But that's all I recall.
23 Q. Did Jeffrey ever talk to you -- let me
24 back up a moment.
25 Have you ever been propositioned by anyone

1 A. Just flying over it.
2 Q. When you said they called, do you know who
3 called your roommate?
4 A. I don't know who called my roommate.
5 Q. In this sort of pre-trip to New York
6 period, do you recall discussing any of the
7 particulars of your massages with Jeffrey, with
8 Ghislaine?
9 MS. McCAWLEY: Objection.
10 BY MS. MENNINGER:
11 Q. If that makes sense.
12 A. No.
13 Q. So before you got this call, had anyone
14 mentioned the idea of traveling to you?
15 A. No.
16 Q. Did you call Jeffrey immediately?
17 A. I did.
18 Q. And what conversation did you have with
19 him?
20 A. Basically he said, I want to take you
21 to -- to New York City. Can you be here quickly?
22 And I got to the house, and he said, Do
23 you have your passport?
24 I said, No.
25 He said, Go get it.

EXHIBIT 7

IMII 12/10/04 DDA STATEMENT HISTORY 10.02.11 PAGE 1

JEFFREY E EPSTEIN OR ACCOUNT 000-000-0000-[illegible]

GHISLAINE MAXWELL OR ALFREDO RODRIGUEZ DATE LAST STATEMENT 11/23/04

HOUSEHOLD ACCOUNT DATE THIS STATEMENT 12/10/04

*****DDA TRANSACTIONS*****

BEGINNING BALANCE	CHECKS/OTHER DEBITS NBR	TOTAL AMOUNT	DEPOSITS/OTHER CREDITS NBR	TOTAL AMOUNT	ENDING BALANCE
0.00	10	4006.36	2	7439.80	3433.44

DATE	CK NBR	AMOUNT	TP	TRANSACTION DESCRIPTION	BALANCE
10/14		7439.56	DP	DEPOSIT	7439.56
10/25	93	450.00	CK	TELLER CASHED CHECK	6989.56
10/25		0.24	CR	IOD INTEREST PAID	6989.80
10/27		69.38	DB	CLARKE AMERICAN CHK ORD	6920.42
11/01	2500	1150.00	CK	TELLER CASHED CHECK	5770.42
11/08	2504	340.00	CK	CHECK	5430.42
11/09	2502	684.87	CK	CHECK	4745.55
11/09	2505	415.86	CK	CHECK	4329.69
11/09	2503	406.25	CK	CHECK	3923.44
11/15	2511	360.00	CK	CHECK	3563.44
11/15	2512	80.00	CK	CHECK	3483.44
11/15	2501	50.00	CK	CHECK	3433.44

PF1 - PAGE FWD

ESC=CLEAR SCREEN ALT-F2=PRINT SCREEN ALT-X=EXIT 7

561 820-8790

Dec 10 2004 11:13AM No.1043 P. 7

IMII 12/10/04 DDA STATEMENT HISTORY 10.02.11 PAGE 2

JEFFREY E EPSTEIN OR ACCOUNT 000-000-0000

GHISLAINE MAXWELL OR ALFREDO RODRIGUEZ DATE LAST STATEMENT 11/23/04

HOUSEHOLD ACCOUNT DATE THIS STATEMENT 12/10/04

*****DDA TRANSACTIONS*****

BEGINNING BALANCE	CHECKS/OTHER DEBITS NBR	TOTAL AMOUNT	DEPOSITS/OTHER CREDITS NBR	TOTAL AMOUNT	ENDING BALANCE
0.00	19	11614.78	4	17440.24	5825.46

DATE	CK NBR	AMOUNT	TP	TRANSACTION DESCRIPTION	BALANCE
11/16	2507	1135.03	CK	CHECK	2298.41
11/16	2509	803.24	CK	CHECK	1495.17
11/16	2506	344.91	CK	CHECK	1150.26
11/16	2508	125.24	CK	CHECK	1025.02
11/16	2510	110.00	CK	CHECK	915.02
11/17	2514	80.00	CK	TELLER CASHED CHECK	835.02
11/18		10000.00	CR	INCOMING WIRE CREDIT	10835.02
11/18		10.00	DB	INCOMING WIRE FEE	10825.02
11/18		*2500.00	CK	TELLER CASHED CHECK	8325.02
11/22	2513	2500.00	CK	CHECK	5825.02
11/23		0.44	CR	IOD INTEREST PAID	5825.46

LAST PAGE PF2 - PAGE BKWD

ESC=CLEAR SCREEN ALT-F2=PRINT SCREEN ALT-X=EXIT E 7

HOUSE_OVERSIGHT_014293

IMI3 12/10/04 DDA STATEMENT INQUIRY 10.02.31 PAGE 1

JEFFREY E EPSTEIN OR ACCOUNT 000-000-000C
GHISLAINE MAXWELL OR ALFREDO RODRIGUEZ DATE THIS STATEMENT 12/10/04
HOUSEHOLD ACCOUNT DATE LAST STATEMENT 11/23/04

*****DDA TRANSACTIONS*****

BALANCE LAST STATEMENT	CHECKS/OTHER DEBITS NBR	TOTAL AMOUNT	DEPOSITS/OTHER CREDITS NBR	TOTAL AMOUNT	BALANCE THIS STATEMENT
5825.46	10	9038.14	1	10000.00	6787.32

DATE	CK NBR	AMOUNT	TY	TRANSACTION DESCRIPTION	BALANCE
11/30	2515	125.00		CHECK	5700.46
12/03	2516	1600.00		CHECK	
12/03	2517	549.29		CHECK	3551.17
12/06		10000.00		INCOMING WIRE CREDIT	
12/06		10.00		INCOMING WIRE FEE	
12/06		2000.00		TELLER CASHED CHECK	11541.17
12/07	2521	517.74		CHECK	
12/07	2522	210.00		CHECK	
12/07	2518	101.03		CHECK	10712.40
12/08	2519	2925.08		CHECK	
12/08		1000.00		TELLER CASHED CHECK (To Mr. J.E)	6787.32

ESC=CLEAR SCREEN ALT-F2=PRINT SCREEN ALT-X=EXIT E 7

HOUSE_OVERSIGHT_014294

EXHIBIT 8

→ Colonial Bank / Worth Ave
- Ben Lenn
- Leonor

BANKING

Household Banking Account	Palm Beach National Bank 125 Worth Avenue Palm Beach, FL 33480 **Tel: (561) 653-5594**	Account No: [redacted] Send to Eric Gany for reconciliation $1,000 Petty Cash Float

BICYCLES

Bicycles	Palm Beach Bicycle Trail Shop 223 Sunrise Avenue Palm Beach, FL 33480 **Tel: (561) 659-4583**	Mongoose Crossway 450 Raleigh Aluminium 300 Mercedes Benz Cignal Sports Bike Schwinn World Huffy Santa Fe Raleigh Sport Scott Boston

BOOKSTORES

Newspapers	Publix Super Market 265 Sunset Avenue Palm Beach, FL 33480 **Tel: (561) 655-4120**	
Magazines	Main Street News 255 Royal Poinciana Way Palm Beach, FL 33480 **Tel: (561) 833-4027**	

CLEANING SERVICE

Francis Peadon **House Cleaning Services**	**(561) 833-4486** (561) 635-3068 Coll. 1. (561) 309-5820 " 2. (56) 346-1119	Every Tuesday and Wednesday 8:00am - 4:00pm (Francis and Pastora Peadon)

ENTERTAINMENT

The Breakers	One South County Road Palm Beach, FL 33480 **Tel: (561) 655-6611**	Renew car park stickers every September
Comedy Corner	2000 South Dixie Highway West Palm Beach, FL 33401 **Tel: (561) 833-1812**	
The Mar-a-Lago Club	1100 South Ocean Boulevard Palm Beach, FL 33480 **Tel: (561) 832-2600**	

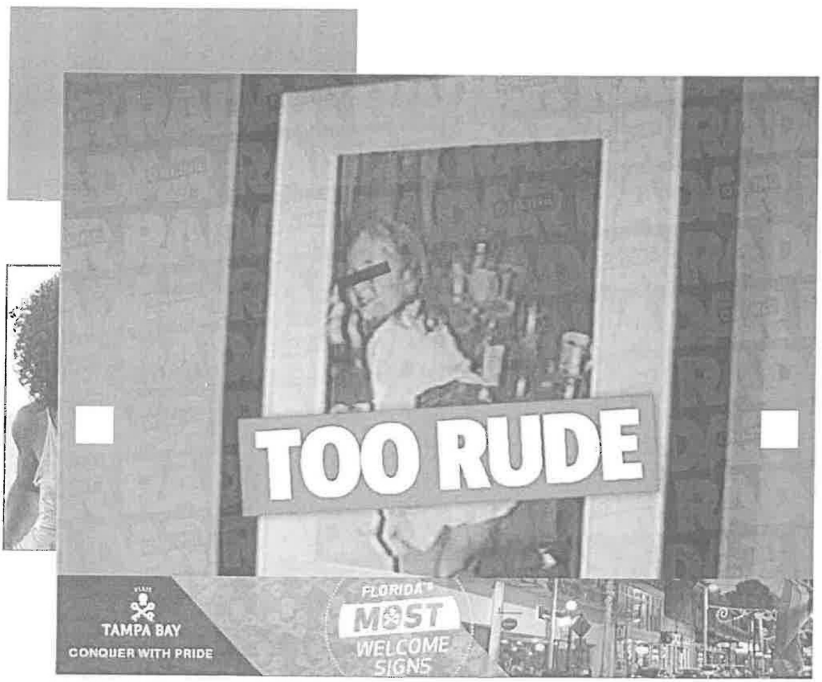
EXHIBIT 9

BRITNEY SPEARS & BEYONCE'S VMA FEUD ANTHONY WEINER SPLIT

THE REAL REASON TOM CRUISE HASN'T SEEN HIS DAUGHTER IN YEARS

19 ACTORS WHO WERE BORN FILTHY RICH

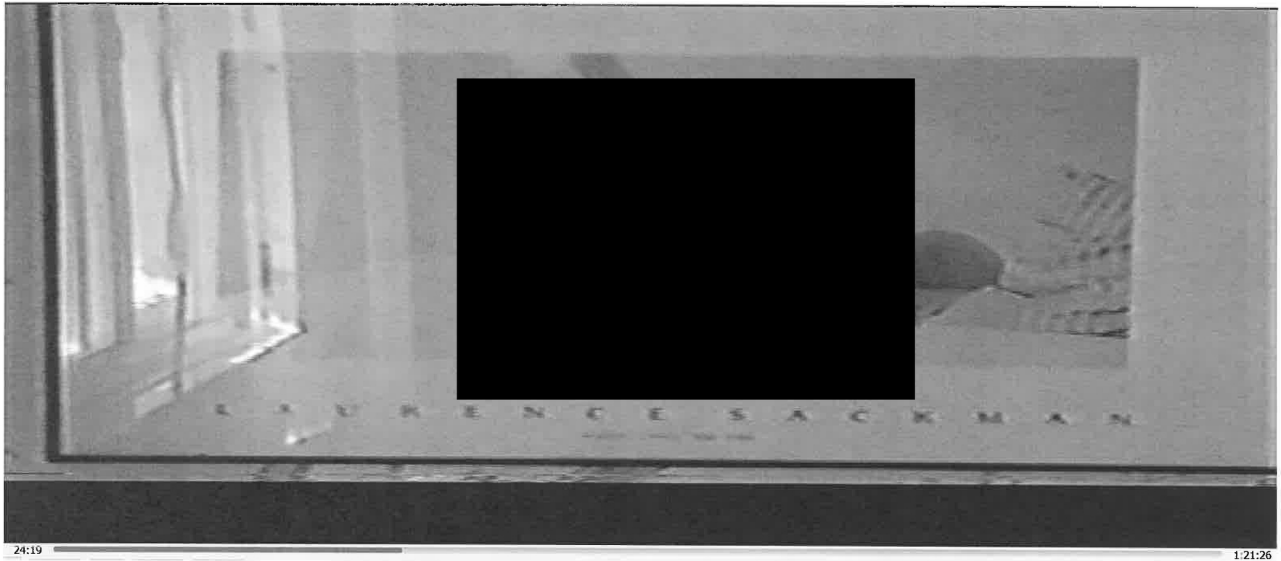
EMAIL US A TIP



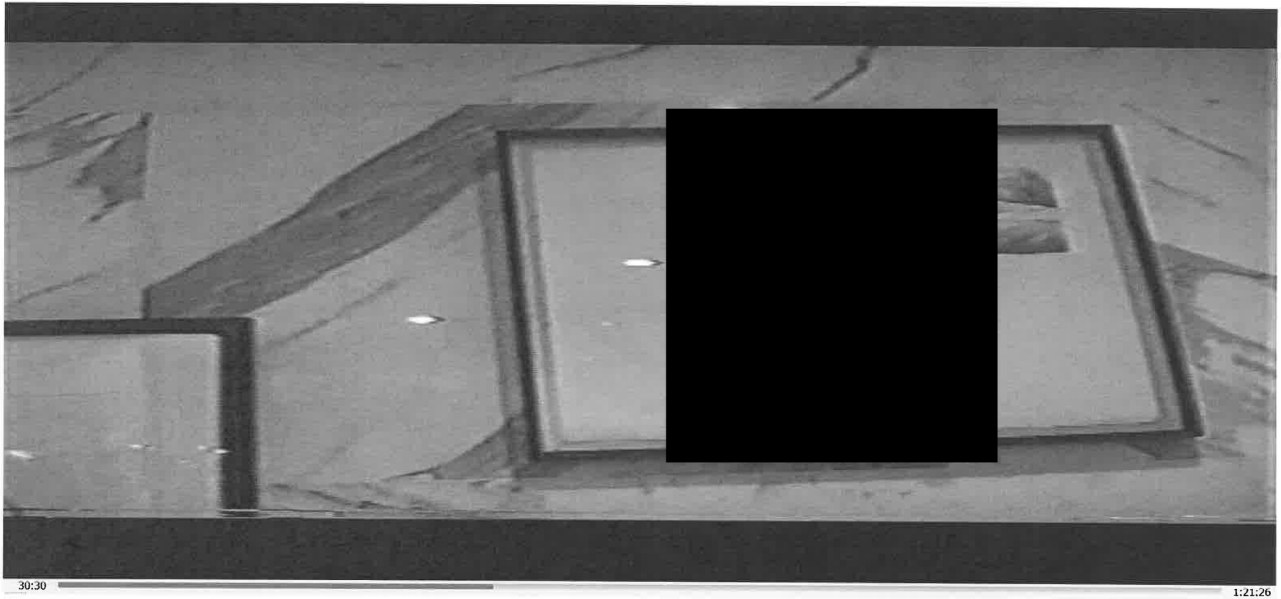
YOU MAY LIKE

Sponsored Links by Taboola

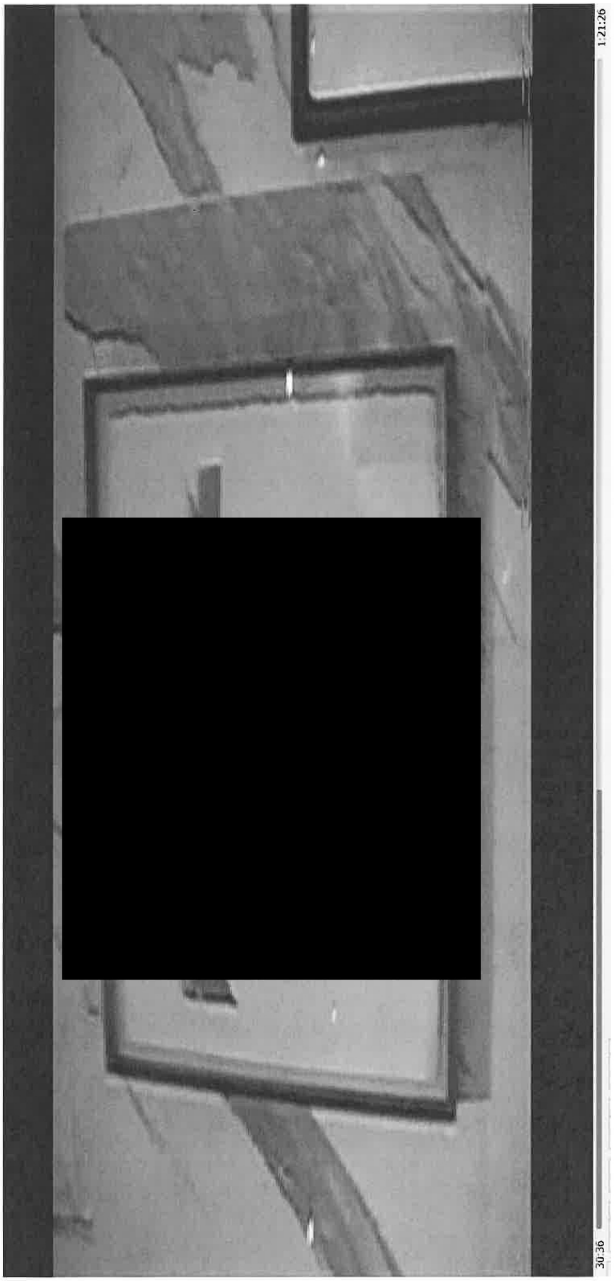
30:54 1:21:26



24:19 1:21:26



30:30 1:21:26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30:36

EXHIBIT 10

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

CASE NO. 15-CV-07433-RWS

----------x

VIRGINIA L. GIUFFRE,

Plaintiff,

v.

GHISLAINE MAXWELL,

Defendant.

----------x

June 20, 2016
9:12 a.m.

C O N F I D E N T I A L

Deposition of [redacted], pursuant to notice, taken by Plaintiff, at the offices of Podhurst Orseck, 25 West Flagler Street, Suite 800, Miami, Florida, before Kelli Ann Willis, a Registered Professional Reporter, Certified Realtime Reporter and Notary Public within and for the State of Florida.

MAGNA
LEGAL SERVICES

1 [redacted] - CONFIDENTIAL
2 men and women bodies mixed together.
3 Q. Okay. Do you remember the photographs?
4 MR. PAGLIUCA: Object to form and
5 foundation.
6 THE WITNESS: Not specifically, no.
7 BY MR. EDWARDS:
8 Q. At the point during your statement, the
9 specific passage that I'm asking about is, you say,
10 "Teenage, he's got lots of pictures of teenage
11 girls, like real photos that he took."
12 A. Yeah. They were not displayed.
13 MR. PAGLIUCA: Object to form and
14 foundation.
15 BY MR. EDWARDS:
16 Q. Okay. Where were they?
17 A. I remember one incident where he showed
18 them to me, and they were young women in the
19 bathtub.
20 Q. And did he take pictures of you?
21 A. Yes.
22 Q. Did he take pictures of you naked?
23 A. Yes. As far as I know, they were never
24 recovered.
25 Q. How could you tell that the photographs

EXHIBIT 11

IN THE CIRCUIT COURT OF THE FIFTEENTH JUDICIAL CIRCUIT
IN AND FOR PALM BEACH COUNTY, FLORIDA
CASE No.502009CA040800XXXXMBAG

JEFFREY EPSTEIN,

Plaintiff,

-vs-

SCOTT ROTHSTEIN, individually,
BRADLEY J. EDWARDS, individually, and
L.M., individually,

Defendants.

VIDEOTAPED DEPOSITION OF JEFFREY EPSTEIN

Wednesday, March 17, 2010
10:17 a.m.- 1:27 p.m.

303 Banyan Boulevard
Suite 400
West Palm Beach, Florida 33401

Reported By:
Sandra W. Townsend, FPR
Notary Public, State of Florida
West Palm Beach Office Job #1358

Electronically signed by Sandra Townsend (401-377-676-2895)
Electronically signed by Sandra Townsend (401-377-676-2895)
1ddcfb84-b324-4437-a670-765e29067145

1 Amendment Rights as provided by the U.S.
2 Constitution.
3 BY MR. SCAROLA:
4 Q. Does a flight log kept for a private jet used
5 by you contain the names of celebrities, dignitaries or
6 International figures?
7 A. At least today, sir, I'm going to have to
8 respectfully decline to answer based on my Fifth, Sixth
9 and 14th Amendment Right, though I'd like to answer that
10 question.
11 Q. Have you ever had a personal relationship with
12 Donald Trump?
13 A. What do you mean by "personal relationship,"
14 sir?
15 Q. Have you socialized with him?
16 A. Yes, sir.
17 Q. Yes?
18 A. Yes, sir.
19 Q. Have you ever socialized with Donald Trump in
20 the presence of females under the age of 18?
21 A. Though I'd like to answer that question, at
22 least today I'm going to have to assert my Fifth, Sixth
23 and 14th Amendment Right, sir.
24 Q. Have you socialized with Alan Dershowitz?
25 A. Yes, sir. He's my attorney, as well as a

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Electronically signed by Sandra Townsend (401-377-676-2895)
1ddcfb84-b324-4437-a670-765e29067145

1 friend.
2 Q. Have you ever socialized with Alan Dershowitz
3 in the presence of females under the age of 18?
4 MR. PIKE: Form.
5 THE WITNESS: Sir, at least here today, I'm
6 going to have to assert my Fifth Amendment, Sixth
7 Amendment and 14th Amendment Rights.
8 BY MR. SCAROLA:
9 Q. Have you ever socialized with Tommy Mottola?
10 A. This is the type of questions where people who
11 have nothing to do with this case whatsoever have been
12 brought into the case by Mr. Edwards in an attempt to
13 simply imperil my relationships with social friends and
14 serves as an example of why this case has been brought
15 against Mr. Edwards and his firm, sir.
16 MR. PIKE: Form as well.
17 BY MR. SCAROLA:
18 Q. Well, do you know who brought those persons'
19 names into this lawsuit?
20 MR. PIKE: Form.
21 And just to be clear, what Mr. Scarola, I
22 believe, talking about this lawsuit, Epstein versus
23 RRA?
24 BY MR. SCAROLA:
25 Q. Yes, sir, that's the lawsuit I'm talking

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From: Ens, Amanda [redacted]
Sent: 11/15/2016 2:44:06 PM
To: jeffrey E. [jeevacation@gmail.com]; Richard Kahn [redacted]
Subject: SPX put contingent on higher rates
Attachments: image001.jpg; image002.jpg; image003.jpg; image005.png

Importance: High

Navigating post-Trump volatility

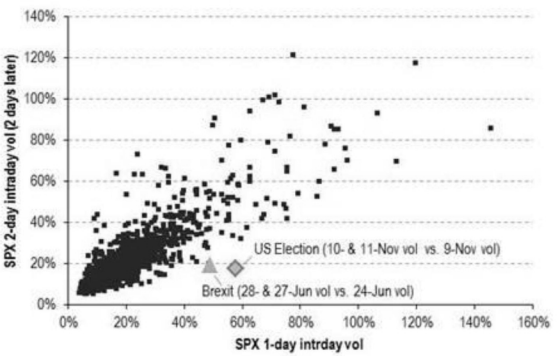
- We are recording unprecedented divergences in falling equity vol with rising rates vol post Trump's win. Intra-day S&P realized vol collapsed from near 60% to below 20% in 2d **[Chart 1]**
- While equities have shown less conviction over what a Trump win means (given strong sector rotation), the bond market has sold off with one of the largest moves in history **[Chart 2 & 3]**
- Stabilizing rates volatility from here is key to markets remaining calm and while equity upside may continue, it is not without higher risks
- We like cheap optionality to hedge long-equities if rates continue to move sharply

For investors long equities, we look at ways to cheapen protecting from downside risks in the event of further bond market volatility catalysed by Trump policy uncertainty

- **Buy an SPX Apr-17 95% put conditional on US 10Y CMS > 2.5% at maturity for 0.87%**
  - 70% discount vs. vanilla
  - CMS ref. 2.11%, SPX ref. 2,164.2

CMS = constant maturity swap

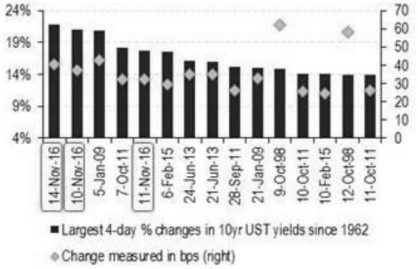
Chart 1: The response in S&P 500 realized equity volatility to the US election surprise was similar to Brexit but more extreme, as the spike in volatility collapsed at record speed



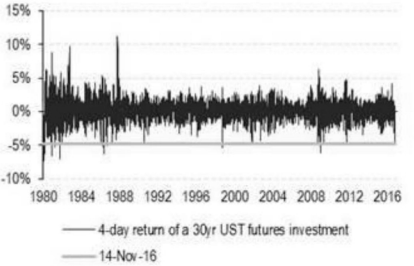
Source: BofA Merrill Lynch Global Research. Based on daily data from June 2004 to current

Chart 2: Ten-year US Treasury yields see a near record spike after the US election

Chart 3: Long Bond futures prices down near record amount (~5%) in the four days since the election



Source: BofA Merrill Lynch Global Research. Based on daily data since 1962.



Source: BofA Merrill Lynch Global Research

Amanda Ens
Director
Bank of America Merrill Lynch
Merrill Lynch, Pierce, Fenner & Smith Incorporated
One Bryant Park, 5th Floor, New York, NY 10036
[redacted]

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Bank of America Merrill Lynch

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From: Ens, Amanda [redacted]
Sent: 11/17/2016 6:05:47 PM
To: jeffrey E. [jeevacation@gmail.com]; Richard Kahn [redacted]
Subject: Financials: buy XLF Mar17 $22 call with $26 KO for $0.87 with full premium rebate on KO
Attachments: image001.png; Future of Financials Conference Takeaways.pdf

Importance: High

Our Financials Conference was this week and client attendance was up by 66% from last year. Yes, banks/financials might pull back at some point after this run-up but we would be buyers on any pullbacks and we continue to see further upside from multiple expansion and earnings growth. Our analyst raised her price targets by ~11% across the board. The long term rotation from bonds and div stocks into sectors like financials is only beginning.

Vol is higher on the week; what prices well now:
Buy the XLF March 2017 $22 call with $26 Knock-Out (continuous) for $0.87, with a full premium rebate if knock-out occurs.
This prices attractively given flat call skew and if XLF breaches $26 and this knocks out, at least you get your premium back.

Please find our Financials report attached.
Future of Financials conference hosted 90 public and private companies at our Future of Financials conference. We are raising our price objectives across most of our names. Three primary reasons why we think there is upside remaining after the recent rally: 1) an improved outlook on both activity levels and interest rates, driving revenue upside; 2) potentially lower regulatory burden, particularly as new supervisory leadership can come with the new administration; and 3) relatively lighter positioning in US financials vs. other sectors. (Erika Najarian)

From: Ens, Amanda
Sent: Monday, November 14, 2016 12:05 PM
To: 'jeffrey E.'; 'Richard Kahn'
Subject: RE: Financials trade for Monday

We continue to see buyers of XLF today. Funds are underweight financials in all regions, valuations are reasonable, earnings are improving and financials tend to outperform when bond yields rise.

Vol is higher today – refreshed pricing below.

Buy an XLF 17March2017 call spread:

- Buy the 105% call / sell a 110% call with a 115% at-expiry knock-in
- Total premium: 1.86%

Global Positioning in Stocks: Nigel Tupper notes the 4000 funds in our "Positioning in Stocks" analysis are more underweight Financials, on average, than any other sector and are underweight this sector in all regions of the world. If earnings continue to improve and yield rise, which is often the case in an upturn in our Global Wave, then the unloved Financials sector has the potential to continue to outperform.

Global Quant Panorama: "Bearish on Bonds" stocks (which tend to move in the opposite direction to bond yields) tend to outperform our "Bullish On Bonds" when bond yields rise. The sectors that tend to perform best as bond yields rise are Energy, Tech, Materials, Banks, and Diversified Financials. Of these sectors, the laggards this year have been Banks and Diversified Financials. With a PE of 15.9x and a PB of 2.0x, Global valuations are reasonable. Also, Risk is near all-time lows in terms of PE in most regions. Now that macro and earnings data have triggered the beginning of a rotation, Value becomes very relevant.

From: Ens, Amanda
Sent: Friday, November 11, 2016 4:04 PM
To: 'jeffrey E.'; 'Richard Kahn'
Subject: Financials trade for Monday

It's not too late to buy financials as a medium term trade. They've run up a lot this week but we're getting endless calls from generalists asking which banks to buy – there is still more upside to the sector. Banks also provide some offset to your bonds if interest rates continue to move. Our financials sector specialist thinks XLF could have another 20-25% upside given its many levers to the Trump trade: less regulation, higher interest rates/steeper yield curve, higher vol, economic growth, etc. The regional banks are asset sensitive and more of a pure play on a rates move but we view the larger cap banks as having even more upside to the Trump Trade given the above points.

Buy an XLF 17March2017 call spread:

- Buy the 105% call / sell a 110% call with a 115% at-expiry knock-in
- Total premium: 1.75%

All eyes are on Sunday's 60 Minutes interview with Trump. Market is pricing that all regulations will be rolled back (very optimistic). Any hint that this is not true could lead to pullback on Monday.

Note on tech: we're seeing FANG used as a source of funds with the rotation from growth into value. There's also the tax read-through: tech is already relatively tax advantaged @ 22%; Industrials are at 30%, Financials at 29%. Next year, tech could benefit from a repatriation tax holiday but that is viewed as more of a Q1/Q2 trade.

More thoughts on financials:
With respect to the economy, the market is certainly indicating that there will be a large fiscal stimulus which may send US growth higher and that's a good thing for financials for a wide variety of reasons, from employment to wages to loan growth and credit quality (even if somewhat offset by higher rates). It does remain to be seen exactly how much of this expected policy actually gets done, but at the moment, investors are willing to take a certain amount of growth on faith.

So those are positives for financials before we even discuss regulation. The move in the financials since the election would seem to indicate that investors have concluded that nearly every piece of financial regulation will get put into a shredder on day one of the new administration. The incoming administration has fueled that with comments about rolling back pieces (or more) of Dodd-Frank in particular. I can see making the case for that to the American public by saying that banks need less regulation in order to get more capital flowing into the economy to drive growth. Not only does that mean that the E is likely too low (meaning that the P/E is not as high as it seems) but it could help improve ROE's as well which could increase the multiple of that higher E investors are willing to pay. Note that while ROEs could go higher, it's unlikely that they can get back to the peaks...

Regards,
Amanda

Amanda Ens
Director
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Management and client bullishness implies further upside

Price Objective Change

Bank of America Merrill Lynch

Equity | 17 November 2016 Corrected

Conference tone bullish into 2017

We recently hosted over 90 public and private companies and 700 attendees at our Future of Financials conference, where investor attendance was up an impressive 66% YoY. The tone from management and investors was uniformly bullish, with more generalists attending than we have seen in previous years.

Revenue & regulatory upside + positioning = raising POs

We are raising our price objectives across most of our names. Three primary reasons why we think there is upside remaining after the recent rally: 1) an improved outlook on both activity levels and interest rates, driving revenue upside; 2) potentially lower regulatory burden, particularly as new supervisory leadership can come with the new administration; and 3) relatively lighter positioning in US financials vs. other sectors.

Full house at innovation-focused panels

New this year, we hosted expert panels on the evolution of clearing, fixed income market structure, equity market structure, and payments, and how innovation in blockchain, big data, and robo advisory can change the game. Strong panel attendance suggested high interest in these themes, and polling feedback suggests shareholders want banks to make investment spend in innovation a priority -- so long as it is self funded with savings found elsewhere.

Banks: Most constructive we've heard in years

We are raising our POs for our banks by c11% (see Table 1 page 63). When asked if the election results changed 2017 outlooks, all banks were more enthusiastic about growth. Echoing sentiment from our panel on regulation and M&A, banks were upbeat on the CCAR process potentially evolving post-election. Our top picks out of the conference: WFC (sentiment over retail sales practices clouding EPS sensitivity to improving macro), C (solid momentum on revenues and capital return), IBKC (moving closer to strategic targets), and EWBC (sentiment post-election appears constructive on regulatory relief).

Brokers, Alternatives, and Asset Managers

The sentiment around the capital market sector was mostly favorable post the election outcome, given the potential for de-regulation, pro-growth, rising rates, lower tax rates, and increasing activity levels. For the brokers, given mostly favorable 4Q activity trends (more so for trading vs. banking), 1H17 seasonality with easy comps, and potential for de-regulation and lower taxes – we like the outlook, particularly for GS. For the asset managers, despite the move higher post the election on a potential DOL delay/modification and lower tax rates, most expect the DOL to continue in some form and the core trends remain challenging – we remain cautious. For the alternative managers, while we continue to view the structural growth as attractive and a lower corp tax rate could potentially increase the odds of a transition to a C-corp , given the potential for a higher carry tax, rising rates, and de-regulation of banks potentially moderating some of the newer growth areas, we view the outlook as more balanced.

Specialty / Consumer finance

Companies were generally bullish on the US consumer heading into 2017. AXP presented a fairly upbeat outlook on billings, loan and revenue growth, while cautioning that Discount rate pressures and FX headwinds could impact near-term results. The private tech based lenders were cautiously optimistic that hiccups from earlier this year were behind the sector, while the private payments companies stressed the importance of partnering with incumbent leaders and the need to maintain safety standards.

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Refer to important disclosures on page 78 to 81. Analyst Certification on page 75. Price Objective Basis/Risk on page 64.

11687665

Timestamp: 17 November 2016 06:24AM EST

United States
Banks

US Financials
MLPF&S

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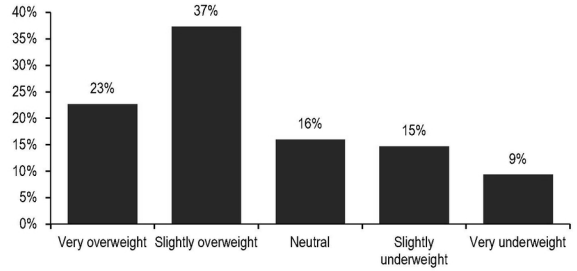
Conference tone bullish into 2017

We recently hosted over 90 public and private companies and 700 attendees at our Future of Financials conference, where investor attendance was up an impressive 66% YoY. The tone from management and investors was uniformly bullish, with more generalists attending than we've seen in previous years. When asked how they would describe their portfolio positioning in financial stocks, 60% of the investors polled noted that they are either slightly overweight or very overweight the sector (see Chart 1).

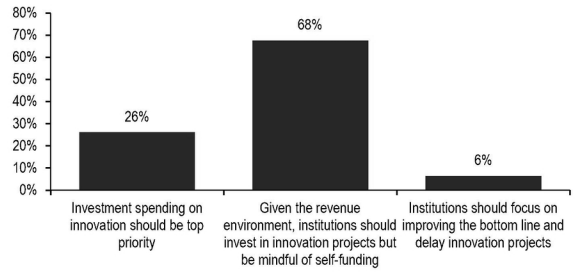
Chart 1: How would you describe your portfolio positioning in financial stocks, excluding insurance and REITs?



Source: BofA Merrill Lynch Global Research

New this year, we hosted expert panels on the evolution of clearing, fixed income market structure, equity market structure, and payments, and how innovation in blockchain, big data, and robo advisory can change the game. Strong panel attendance suggested high interest in these themes, and polling feedback suggests shareholders want banks to make investment spend in innovation a priority -- so long as its self funded with savings found elsewhere. 68% of those polled across multiple company presentations believed that institutions should invest in innovation projects but be mindful of self-funding (see Chart 2).

Chart 2: Chart 2: As a shareholder, what statement most closely aligns with your view on how traditional financial institutions should allocate investment spending on innovation?



Source: BofA Merrill Lynch Global Research

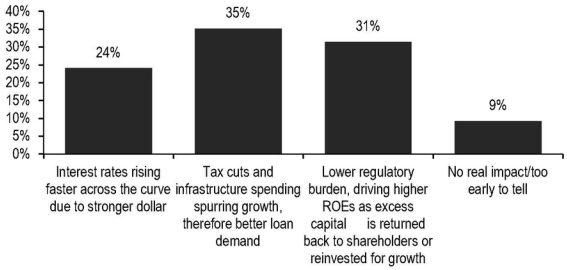
Bank of America Merrill Lynch

HOUSE_OVERSIGHT_014316

Banks Takeaways

With our conference coming a week following a historic US presidential election that helped boost bank stocks by 12%, bank management teams were generally optimistic with regards to the economic outlook heading into 2017. Greater fiscal stimulus that is expected to spur economic growth coupled with potential regulatory relief has helped improve the overall sentiment in the sector. When asked what the biggest impact of the GOP sweep would likely be to bank earnings, 35% noted tax cuts and infrastructure spurring growth as the biggest impact.

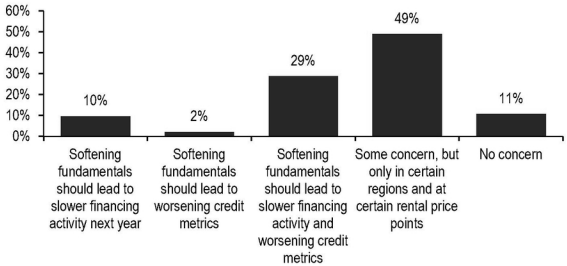
Chart 3: What do you think is the biggest impact of the GOP sweep to bank earnings?



Source: BofA Merrill Lynch Global Research

An area that has attracted particular attention among bank investors is around the current landscape of multifamily lending. We polled the audience around their outlook for multifamily lending in 2017 and found that 49% of those polled said there was some concern, but only in certain regions and at certain rental price points. Meanwhile, 29% noted softening fundamentals that should lead to slower financing activity and worsening credit metrics (see Chart 4).

Chart 4: How do you view fundamentals for multifamily lending in 2017?



Source: BofA Merrill Lynch Global Research

HOUSE_OVERSIGHT_014317

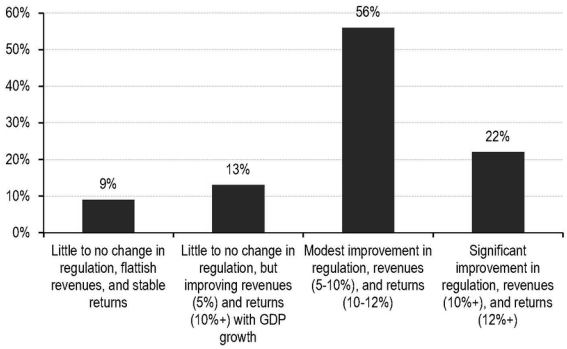
Brokers Takeaways

In brokers, GS presented, while MS hosted 1-1 meetings with investors. During the conference we polled the audience on several topics including the outlook for capital markets revenues.

Investors modestly positive on capital markets over next 1-2 years

Given the election outcome, recent rise in rates, potential for higher growth and de-regulation, and lower corporate tax rates, we asked investors about their outlook for capital markets over the next 1-2 years. The majority of investors (78%) were positive about the capital markets sector, with 56% who expect modest improvement in regulation, revenue growth of 5-10%, and returns of 10-12% and 22% who think we could see significant improvement in regulation, revenues growth of 10%+, and returns 12%+.

Chart 5: Based on the backdrop and the election outcome, what is your outlook for the capital markets over the next 1-2 years



Source: BofA Merrill Lynch Global Research

Asset Manager Takeaways

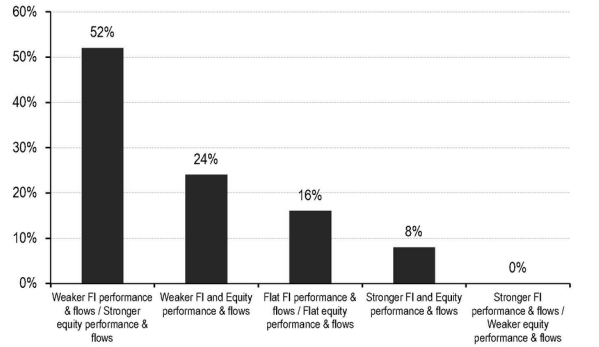
In asset management, four of the largest public managers, IVZ, EV, LM, and AB either presented or engaged in fireside chats, while several other firms including AMG, APAM, BLK, CNS, OMAM, and VRTS hosted 1-1 meetings with investors. During the conference we polled the audience on several topics including the outlook for DOL (in the panel section), the outlook for fixed income given the recent rise in rates/expected rate hike and outlook, active vs passive market share, M&A, and pricing/fee structures.

Fixed income outlook more muted

Given the recent rise in rates, a looming rate hike in December, and the potential for a higher growth/inflation outlook for the economy, we asked investors their outlook on fixed income performance and flows vs equities. The majority of investors believe we will see weaker fixed income performance and flows offset by stronger equity performance and flows (52%). Weaker fixed income/equity performance and flows was the second most popular answer at 24% while flat flows and performance came in third at 16%. Only 8% of the audience think we will see stronger fixed income/equity performance and flows, while nobody thinks fixed income will be stronger and equity will be weaker (both flows and performance).

HOUSE_OVERSIGHT_014318

Chart 6: What is your outlook on fixed income performance and flows versus equities?

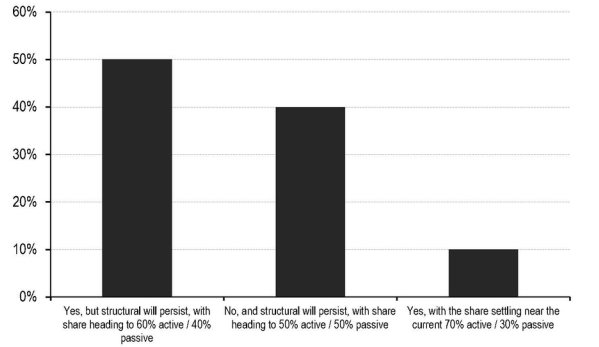


Source: BofA Merrill Lynch Global Research

Active vs passive outlook – passive to continue to gain share

Given the ongoing shift to passive investing from active, we polled the audience to see where they think the share split between the two styles eventually settles. Currently the share split is roughly 70% active and 30% passive which was the least popular answer (10%) when asked "do you see improving cyclical demand for active management, despite structural headwinds, and if so where do you think active/passive share settles?" Most investors do see improving cyclical demand for active management and think passive will eventually control 40% of the market (50%) while 40% of respondents do not see improving trends for active and that passive will eventually capture 50% of the market.

Chart 7: Do you see improving demand for active & where do you think active/passive share settles?



Source: BofA Merrill Lynch Global Research

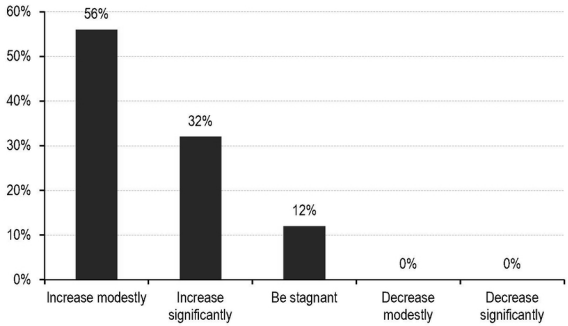
M&A activity likely to rise

Given a recent pickup in M&A and pressures within the industry that will likely continue the trend, including rising regulatory costs, some fee pressure, and active outflows, we asked investors their outlook for M&A in the sector. We found that the majority think

HOUSE_OVERSIGHT_014319

that the number of deals in the asset management sector will increase modestly in 2017 vs 2016 (56%), 32% see M&A picking up significantly, and 12% see flat activity in 2017. Nobody sees lower M&A activity in 2017 vs 2016.

Chart 8: How will 2017 asset management M&A activity (# of deals) be versus 2016?

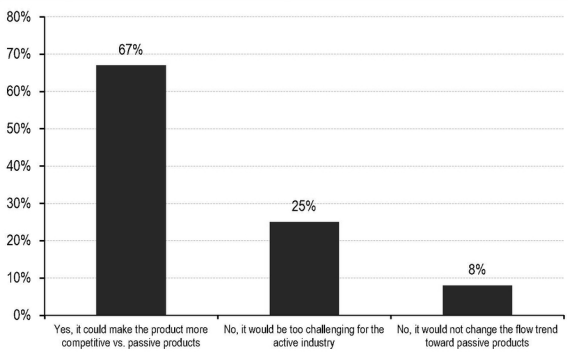


Source: BofA Merrill Lynch Global Research

Pricing/fee structure in retail seems to have more of a following

Given some underperformance of active managers, some scrutiny around fees, as well as fee pressure from passive, we asked investors if they thought a change in active pricing could make sense, i.e. charge a lower base fee with a variable performance fee that would be earned when alpha is generated. We found a majority of respondents thought it would make sense to change the pricing structure and it could make active more competitive vs passive (67%). The rest of respondents felt it didn't make sense either because it would be too challenging for the active industry or it would not slow the flows into passive.

Chart 9: Do you think a change in industry active pricing (lower base + perf fee) could make sense?



Source: BofA Merrill Lynch Global Research

Bank of America Merrill Lynch

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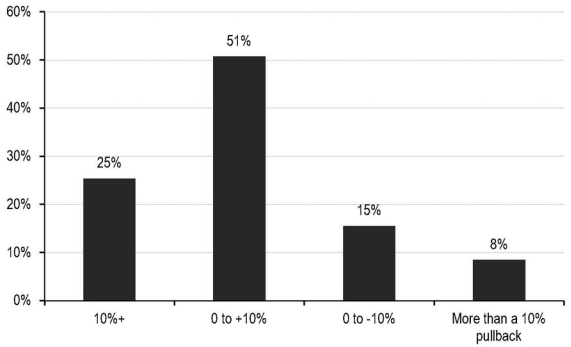
Alternative Asset Manager Takeaways

Within alternative asset management, four of the public managers, ARES, BX, CG, and KKR presented, while the others did meetings. During the conference we polled the audience on several key topics including the outlook for the equity and real estate markets, potential impacts from the recent election, distribution outlook, and firm structures and business models. Investors were generally bullish on the equity market, potential for fiscal stimulus ahead, and a key focus from investors was on the potential change in taxes following the election, and whether that means reassessing corporate structures for the alts, with a possible change from PTP to C-corp.

Investors bullish on the equity markets

Our polling results indicate that investors are generally positive on equity market returns over the next year. When asked "What is your expectation for equity market returns over the next year?" the most common response was +0-10% (51%), followed by 10%+ (25%), 0 to -10% (15%), and <-10% (8%).

Chart 10: What is your expectation for equity market returns over the next year?



Source: BofA Merrill Lynch Global Research

Investors are less positive on the real estate market

When asked "Where do you think we are in the overall Real Estate cycle?" most people think that we are in the middle innings with a few pockets of concern (57%), followed closely by later innings with growing areas of concern (42%). Very few people think that we are in the early innings of the real estate cycle (1%).

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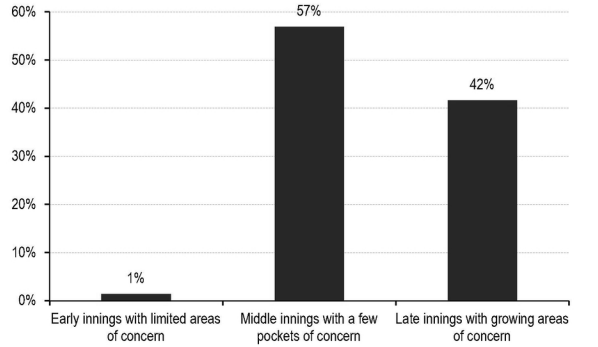
Chart 11: Where do you think we are in the overall Real Estate cycle?

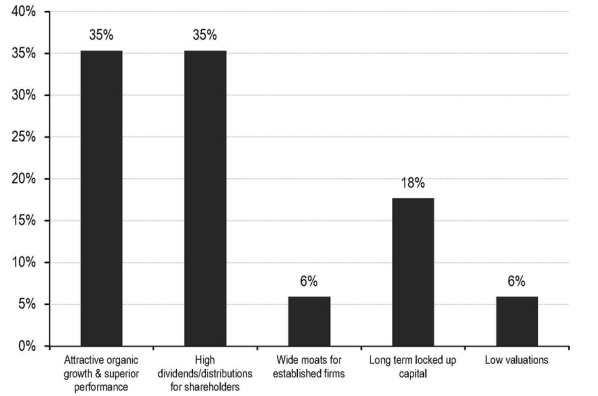


Source: BofA Merrill Lynch Global Research

Investors like the growth, superior performance, & distributions

When asked "What is the most attractive aspect of investing in an alternative asset manager?" investors like both attractive growth & superior performance and high dividends/distributions (both at 35%). Investors also like the long term locked up capital (18%), while low valuations and wide moats were less important (both at 6%).

Chart 12: What is the most attractive aspect of investing in an alternative asset manager?



Source: BofA Merrill Lynch Global Research

Despite moderating distributions of late, most expect flat to higher in '17

When asked "Where do you think distributions for the industry will be in 2017 vs. 2016?" investors expect roughly flat or up 5-15% (both at 37%), followed by down 5-15% (21%). Few investors expect distributions to change more than 15% year-over-year.

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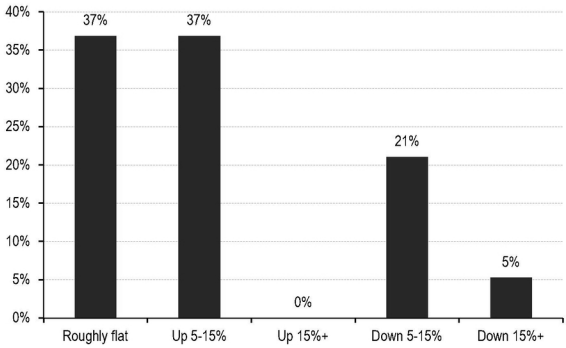
Chart 13: Where do you think distributions for the industry will be in 2017 vs. 2016?

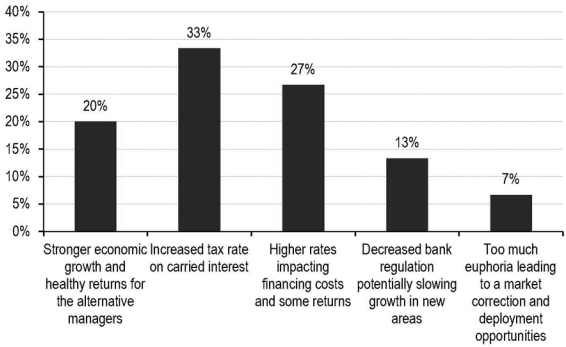


Source: BofA Merrill Lynch Global Research

Election results could have far reaching impacts for the sector

When asked "What is the most likely impact from the election results on the alternative asset managers?" investors were fairly mixed in their responses, indicating to us that investors expect a number of changes. The most common response was increased tax on carried interest (33%), followed by higher rates impacting financing costs and some returns (27%), then stronger economic growth and healthy returns (20%). Few investors expect a decrease in bank regulation slowing alternative manager growth in new areas (13%) along with too much euphoria leading to a market correction (7%).

Chart 14: What is the most likely impact from the election results on the alternative asset managers?



Source: BofA Merrill Lynch Global Research

Specialty / Consumer finance Takeaways

Companies were generally bullish on the US consumer heading into 2017. AXP presented a fairly upbeat outlook on billings, loan and revenue growth, while cautioning that Discount rate pressures and FX headwinds could impact near-term results. The

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private tech based lenders were cautiously optimistic that hiccups from earlier this year were behind the sector, while the private payments companies stressed the importance of partnering with incumbent leaders and the need to maintain safety standards.

US Banks Top Takeaways

Associated Bancorp (ASB) B-3-7, Underperform

- **A strong Midwest market should lead to steady growth**: ASB's CEO Phillip Flynn and CFO Chris Niles highlighted the strong fundamentals of the bank's Midwest footprint with its low unemployment and a strong manufacturing base. While commenting on the potential for relief coming out of DC under the new Trump administration, management noted that shortage of skilled workers was probably the biggest issue impeding businesses in its footprint versus higher taxes or an overly stringent regulatory environment.
- **CRE represents a growth opportunity**: Management was positive on growth prospects within the CRE loan portfolio, which represents 24% of avg loans as of 3Q16. Management is targeting CRE to represent 30-40% of the portfolio in order for consumer, CRE, and commercial to each comprise approximately a third of the loan book. In the near term, executives see opportunities in the CRE space in 2017 as pricing and structure improve benefitting from a pullback by lenders with high CRE concentration.
- **Energy portfolio should begin to stabilize**: While management analyzes the energy book on a credit by credit basis, it noted caution if oil prices fell significantly. However, management noted that the energy book reflects lower energy prices as new energy loans price in lower hydrocarbon pricing vs. the maturing loans. Regarding energy loan growth, management expects muted growth going forward as the benefit from new loans will most likely be offset by continued pay-downs by existing customers.
- **Dec rate hike to surface in 1Q17 margin**: Management expects a Dec rate hike to have little impact on 4Q given that its LIBOR based portfolio would re-price on Jan 1. On the other hand, interest expense is expected to rise as deposits that are linked to benchmark rates re-price higher. Last year, the margin fell 1bp QoQ following the Fed rate hike as deposit costs rose 8bp QoQ. Management noted that 1Q16 saw lower loan renewal rates and compression from cost of funds, but that its cost of funds are in a better position this year, which should help lead to a modest positive impact to the margin in 1Q17 from a Dec rate hike.
- **Fee businesses could get augmented by additional M&A**: Within fees, management views insurance as the best opportunity from non-bank M&A. Recall that ASB completed the acquisition of Ahmann & Martin in 02/15. Management noted that it saw a significant opportunity from providing consulting services around employee benefits to small-to-medium sized businesses. Moreover, any changes to the Affordable Care Act that creates added uncertainty in the market would present an incremental revenue growth opportunity for this business.

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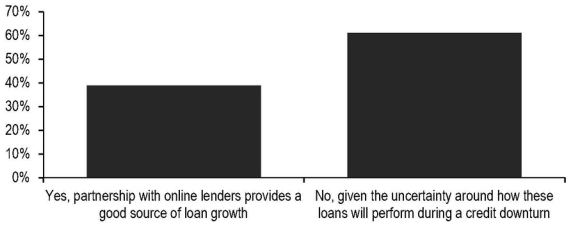
Chart 15: Would you want to see ASB partner with emerging online lenders to augment organic growth?



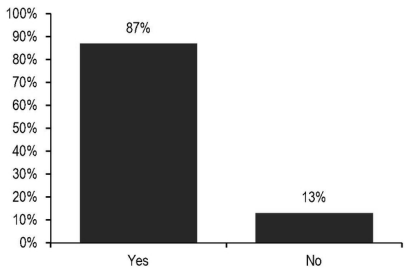
Source: BofA Merrill Lynch Global Research

BB&T (BBT), B-1-7, Buy

- **Pent up demand in small and middle market corporates**. COO Chris Henson was upbeat with regards to the growth outlook for the US economy post the US elections, particularly from middle market companies that have been extremely cautious around making investments over the last few years. Mr Henson noted that as business confidence rises on back of potentially stronger job growth and lower tax reductions, BBT should see strength across its core banking operations.

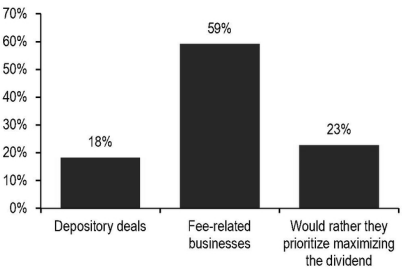
- **Out of M&A in the near term but looking to grow long term**. Management reiterated that it is out of the M&A game for now as it looks to execute on delivering its targeted synergies from recent deals. That said, management expects to eventually engage in M&A deals with BBT having the infrastructure for double its size, noting that scale has become important in the current regulatory landscape. When asked where investors would like BBT to focus on doing deals, 59% noted that it would like management to pursue fee related businesses while 23% would like management to prioritize dividend maximization.

Chart 16: Do you expect the deal activity in financial services to pick up in 2017?



Source: BofA Merrill Lynch Global Research

Chart 17: Once M&A is back on the table, where would you like to see BBT focus on doing deals?



Source: BofA Merrill Lynch Global Research

- **Well positioned from rising rates**. Given the outlook for higher interest rates on both the short and long end of the curve, Mr. Henson noted that while BBT tries to maintain a relatively neutral balance sheet, it would expect to see upside in the margin on back of higher rates. Additionally, higher long rates could also help drive

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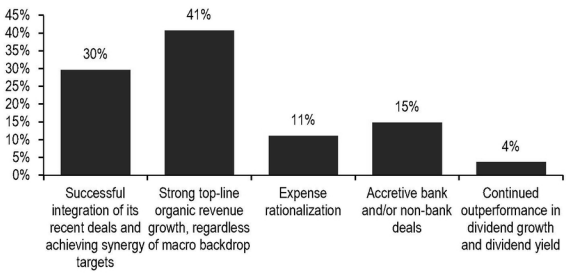
lower pension expense as it reduces the overall discounted pension liability given that BBT remains one of the few large regional banks that still have defined benefit pension plans.

- **Potential for regulatory relief requires BBT to reevaluate risk/compliance spending**. Management noted that 75-80% of its infrastructure budget is based around risk management and regulatory costs. Given the possibility of regulatory relief coming out of the new administration, management noted that it does not want to misallocate its expense spending. As such, management expects to redeploy some of those compliance related costs into revenue and service generation opportunities stemming from any regulatory relief.

- **Branches still have value, but the structure will likely change**. Mr. Henson noted that he still sees value from BBT's branch network but increasing customer usage across its digital channels and with branch transactions down 4%, he expects continued branch consolidation at a pace of more than 2-2.5% over the next couple years. Moreover, management believes that future branches will be likely be smaller in nature and staffed with fewer people that are cross trained with multiple responsibilities. As an example of this, Mr. Henson noted that BBT has combined its teller and relationship banking role into one branch banker role.

Chart 18: What do you think is the biggest catalyst for BBT shares over the next 12-24 months?



Source: BofA Merrill Lynch Global Research

Bank of Hawaii (BOH), B-3-7, Underperform

- **Solid loan growth on back of a strong HI economy**. Chairman, President and CEO Peter Ho, Vice Chairman and CFO Kent Lucien and Senior Executive VP, Controller and Principal Accounting Officer Dean Shigemura were generally upbeat with regards to the operating outlook as we enter 2017. Management guided to achieving low double digit loan growth on the back of a robust Hawaiian economy. While management expects some moderation in C&I growth following a strong 3Q it sounded upbeat around the lending outlook given fairly healthy tourism activity. Management noted that while a de-emphasis on the Pacific Alliance, a priority for the Obama administration, was not a positive development, it remained fairly confident that strong military spending should continue to serve as a tailwind to the Hawaiian economy.

- **Credit outlook remains benign**. Mr. Ho affirmed the credit environment has been benign and believes BOH's strong credit will remain intact in the near future. As loan growth improves, Mr. Ho acknowledged provisions should follow a similar trend, but nothing on the horizon suggests credit will worsen anytime soon. Management acknowledged reserve balances are hard to predict, but believes the

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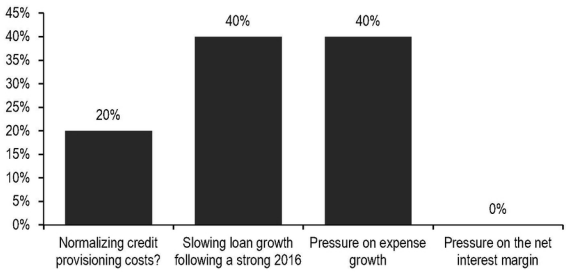
greatest likelihood is for the loan loss reserve ratio is to stabilize near current levels.

- **Remains asset sensitive**. Management acknowledged positive trends coming out of a future Trump administration, with one being the positive benefit from higher rates. With a December rate hike likely on the horizon, CFO Kent Lucien reminded investors that a 25 bp rate increase would benefit NII marginally ($1.5mn on an annual basis), but as the 10yr continues to rally, spread income will benefit more significantly. A 100 bp increase contributes to a 5.2% increase in NII on an annual basis.
- **Continued focus on expenses**. Management expects expenses to come in at the upper end of their 3% to 3.5% guidance this year, mainly due to performance based expenses such as stock based comp and commissions. A potential source of expense savings should be reduction in the size of its branches, not necessarily overall count. While management has piloted this new branch design it believes that converting the entire branch network will be a multiyear process.
- **Capital deployment remains a priority**. BOH continues to provide great transparency in regards to their capital deployment strategy. Management reiterated their commitment to payout 50% of net income in the form of dividends, with a remaining portion going to buybacks. BOH has completed over $400mn in buybacks over the past five years and noted that they are very comfortable with this strategy, given its proven track record.

Chart 19: What do you see as the biggest headwind to BOH's 2017 EPS growth outlook?



Source: BofA Merrill Lynch Global Research

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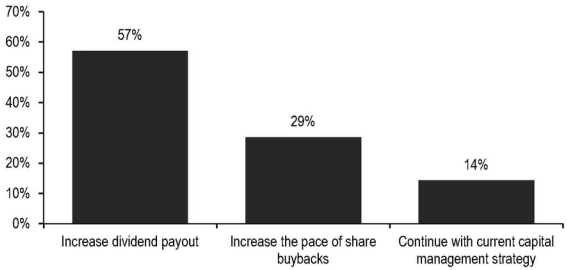
Chart 20: With regard to capital deployment, what would you like management to focus on?

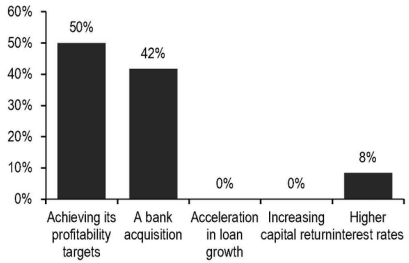


Source: BofA Merrill Lynch Global Research

Capital Bank Financial (CBF), C-1-7, Buy

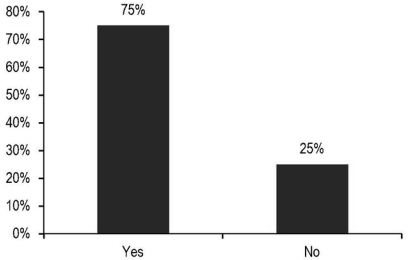
- **Investor expectations for CBF to achieve its ROA target increased YoY**. Of the audience polled, 75% believe CBF to achieve its 1.1% ROA by YE17. This compares to 67% of the audience polled last year. CEO Gene Taylor highlighted both the organic growth opportunities and limited expense growth for the bank to achieve its ROA target. Although the bank is expected to cross $10bn in assets next year, management sounded confident that there would be little incremental expense growth as the bank has already built out leverageable systems.

Chart 21: What do you consider as the single most important catalyst for CBF shares in 2017?



Source: BofA Merrill Lynch Global Research

Chart 22: Do you think CBF will achieve its 1.1% core ROA target by YE17?



Source: BofA Merrill Lynch Global Research

- **Expectations around COB merger remain intact**. CBF reiterated their expectations to fully recognize the 39% of cost savings related to the CommunityOne merger by 2017 year-end. (Systems conversion is slated for mid-1Q17, with initial savings expected to be realized starting 2Q17). During their presentation, management introduced the source of these savings (new disclosure), with the majority expected to come from executive management compensation (23%) and back-office functions (33%).
- **Capital deployment remains a key catalyst for the stock**. Management agreed with the 80% of the audience polled that believe the pace of M&A activity will pick YoY (slightly better than last year's forward expectations). While management noted that it remains focused on integrating COB, and acknowledged that it remains

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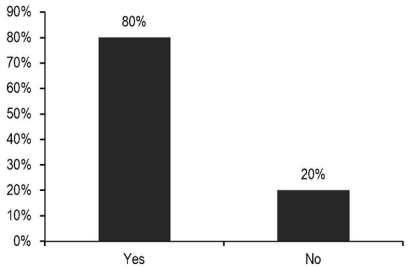
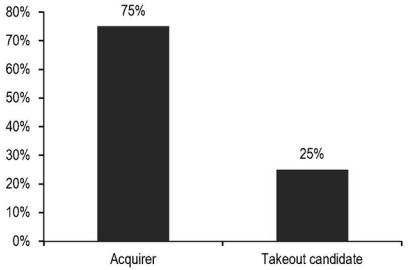
active in terms of M&A discussions, CBF continues to evaluate all opportunities that promise the best returns for shareholders. Interestingly, investor sentiment around CBF's positioning within the M&A market shifted, 75% of respondents believing the pro forma institution is better positioned to act as an acquirer. (Note last year, 55% of respondents believed CBF would be a takeout candidate in the medium term.

Chart 23: Do you think the pace of M&A activity will pick-up significantly in 2017 vs. 2016?



Source: BofA Merrill Lynch Global Research

Chart 24: Does the acquisition of CommunityOne better position CBF as an acquirer or a takeout candidate?



Source: BofA Merrill Lynch Global Research

- **CBF expected to prudently grow in CRE as bank is underpenetrated**. CFO Chris Marshall acknowledged that there exist signs of frothiness within the multi-family lending segment. That said, he noted there is still room to grow as peers pull back in response to regulatory oversight (3Q: 161% vs. 300% threshold). That said, management remains selective and has implemented a 25-30% concentration limit (3Q: 22%).

Citigroup (C), B-1-7, Buy

- **Markets revenue up YoY so far, down from robust 3Q**. President and CEO of ICG Jamie Forese and CFO John Gerspach noted that at this current point in time, they expect a seasonal sequential decline in Markets revenue in 4Q, but revenues should be up YoY on back of stronger activity levels post the election. Moreover, banking activity is looking consistent with prior quarters.

- **DTA impact from lower tax rates**. Given the possibility of lower tax rates under the new administration, there have been many questions around what a potential tax cut could mean on C's ability to re-capture some of its DTA. Management noted that the impact will depend on 1) the ultimate tax rate, 2) either a worldwide or territorial regime, and 3) the time it takes to reflect the new changes. A federal tax cut would directly impact the $21B timing related differences component of its DTA balance. Assuming a 20% decline in the federal tax rate, this would imply a $4B charge to the P&L (20% X $21B). That said, C has $7B of timing difference DTA that is not includable in its regulatory capital. As a result, that $4B impact would not have an impact on its CET1. In the event that there is a territorial regime, there is an element in its foreign subs equal to ~30% of the $21B that would lose its value at an accelerated rate. Assuming a 25% tax rate and territorial regime, management noted that there would be roughly $12B worth of DTA that would see some valuation adjustment and drive a $4B of reduction in its regulatory capital.

- **Aiming to improve market share in Equities**. Management noted that C currently ranks around 8-9th in the Equities business and while it is not looking to achieve a top 3 market share, it would like to improve to around 5-6th. Management noted that the revenue gap to reaching that ranking is ~$1B. While not all of that is

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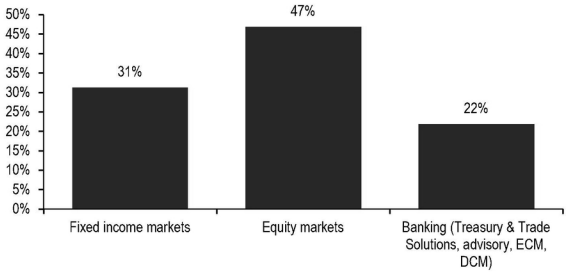
expected to fall to the bottom line, management noted that achieving this would be accretive to its overall margin. We note that when asked where is C's biggest opportunity to take global market share within ICG, 47% of those polled said the biggest opportunity lied within the Equities business.

Chart 25: Where do you think C's biggest opportunity is to take global market share within its IGC business?

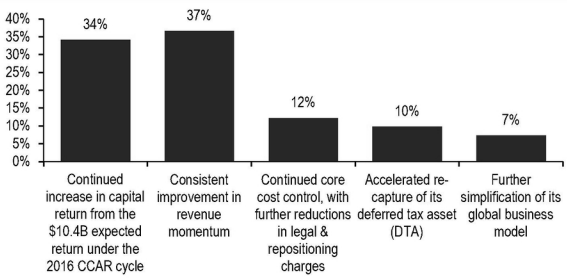


Source: BofA Merrill Lynch Global Research

- **Lower regulatory constraints versus peers present opportunity**. Given C's strong regulatory position such as its above peer SLR ratio, management noted that it can compete in balance sheet intensive businesses such as Rates while more constrained peers are forced to pull back. In terms of its ability to take market share away from European banks, management noted that European banks are more likely to cede share in Fixed Income and less so within Equity and Banking.

- **Longer term goal of 14% ROTCE in ICG**. Management believes that under a more normalized rate environment and through its work towards improving efficiencies across ICG on back of its infrastructure refinements, ICG should be able to achieve a 14% ROTCE vs ~12% today.

Chart 26: Despite material progress, C shares still trade below TBV. What will drive shares to re-rate closer to TBV?



Source: BofA Merrill Lynch Global Research

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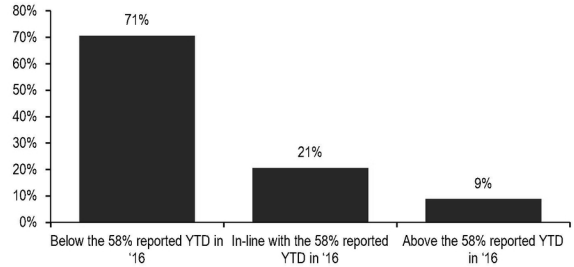
Chart 27: Where do you see Citicorp's efficiency ratio settling in 2017?



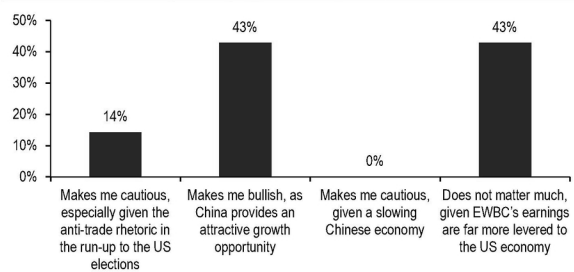
Source: BofA Merrill Lynch Global Research

East West Bancorp (EWBC), B-1-7, Buy

- **Sentiment post-election appears constructive on regulatory relief**. CEO Dominick Ng noted that the industry could be positively impacted should aspects of Dodd-Frank, which have been both challenging and taken up significant internal resources (even for banks below the $50bn SIFI asset threshold), be reformed. Specifically, Mr. Ng believes the pace of expense growth could likely slow. That said, he noted the possibility to shift some of these expense savings to revenue generating areas.

- **EWBC sees limited impact from anti trade rhetoric during the run-up to the US elections**. Although recent political rhetoric on China has had a negative bias, Mr. Ng believes these views are primarily focused on the traditional-manufacturing Chinese industries vs. the country's current strategic emphasis on tech and consumer/retail. Despite having only a 4% exposure to Greater China (includes Hong Kong), EWBC benefits from its unique positioning, both as industry experts in parallel industries and as a relationship bank. Investor sentiment agreed; with 86% of the audience polled have a bullish view of EWBC's China exposure.

Chart 28: How does China exposure impact your investment thesis on EWBC?



Source: BofA Merrill Lynch Global Research

- **EWBC reiterated its strategy to sell CRE loans in favor of portfolio diversification**. Although Mr. Ng expressed caution on the overall commercial real estate (CRE) market, he noted seeing little tangible signs of concern within EWBC's footprint. That said, EWBC could continue to look to sell CRE loans in order to keep the loan portfolio balanced and thereby limit the reliance on any one segment. Note: CRE concentration was 261% of risk-based capital as of 3Q vs. 265% in 2Q.

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- **EWBC to maintain capital for organic growth opportunities**. As of 3Q, EWBC's CET1 ratio was 10.9%. While EWBC isn't opposed to using excess capital for an acquisition (depending on the market landscape), Mr. Ng prefers to use capital to support organic growth opportunities and the dividend (1.75% div yield). With respect to share repurchase, EWBC seemed less enthusiastic to buy back stock at current valuation levels (2.3x TBV).

First Hawaiian (FHB), C-2-7, Neutral

- **Positive outlook around the Hawaiian economy**. Chairman and CEO Robert Harrison and CFO/Treasurer Michael Ching were optimistic with regards to the outlook for the Hawaiian economy, particularly around tourism trends. While the recent strength of the dollar could impact the inflow of foreign tourists (with Japan and Canada the key foreign markets for HI) to the island, management noted that the potential for an increases in domestic tourism could help offset the pressure from any slowdown due to a stronger USD.

- **Positioned well for higher rates**. With regards to its outlook on the impact of potentially higher interest rates, management noted that it remains asset sensitive with 60% of its loan portfolio floating rate. On the funding side FHB expects the deposit beta to remain low given the competitive dynamics in the Hawaii landscape. Management anticipates that another 25bp increase in the Fed Funds rate in December could have a similar impact on the NIM (+6bp) as it experienced following the previous rate hike in Dec '15.

- **Cash deployment to securities completed**. Management noted that it has completed the liquidity actions that it planned to take from deploying excess cash into its securities portfolio and the full impact of this should be visible in 4Q results. Note the securities portfolio duration is 3.3yrs at the end of 3Q16. Management noted that it prefers to keep $400-500mn at the Fed in cash liquidity.

- **Continued focus on maintaining dividend payout**. In terms of capital management, management reiterated that it would like to maintain a healthy dividend payout. Given that additional capital return from buybacks are limited due to the Fed's CCAR process (which FHB is subject to given that it is part of a larger holding company owned by BNP), management intends to increase its capital payout to shareholders (via higher dividend and buybacks) over time.

  Expenses to stay relatively elevated in near term. During the audience poll, when asked about what management should prioritize in 2017, 38% of the investors polled noted that they would like management to manage core expense growth while 31% would like management to increase the dividend payout to over 50% of earnings. Management noted that the efficiency ratio would likely trend around 50%, modestly higher than the 48.5% it reported in 3Q as it incurs additional public company costs ($14.5 – 17mn of expenses), but over time should move back below in the mid-to-high 40s.

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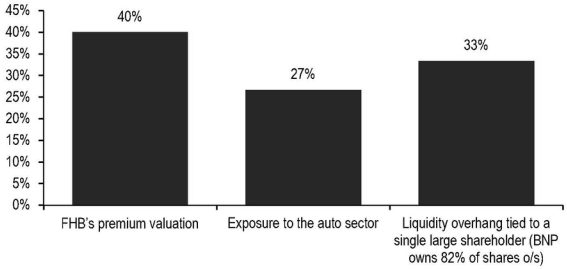
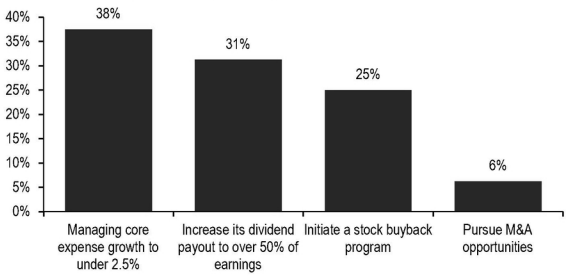
Chart 29: What is the single biggest factor that would prevent you from buying or increasing exposure to FHB?



Source: BofA Merrill Lynch Global Research

Chart 30: What would you like management to prioritize in 2017?



Source: BofA Merrill Lynch Global Research

Great Western Bancorp (GWB), B-1-7, Buy

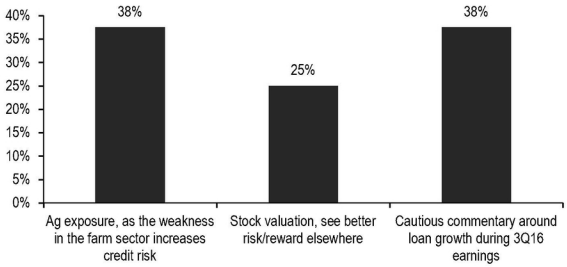
- **GWB sees three potential benefits following the US presidential election results**. Chief Financial Officer Peter Chapman sounded optimistic that clarity around the corporate tax policy could act as a much needed impetus to spur lending activity. Secondly, current prospects for Head of Ag under the new administration are viewed as a net positive for the industry. Lastly, while GWB has already begun to see regulatory costs increase now that they've exceeded $10bn in assets, management could see a potential for compliance costs to rationalize should the new administration reform the regulatory framework.

- **Management's revised growth rate outlook was meant to level set expectations**. During its 3Q16 earnings call, management tempered loan growth expectations slightly to "mid-single" digits for FY16 vs. "mid-to-high" single digits. Interestingly, this was the number one reason among investors polled as to why they were hesitant to increase their exposure to GWB. That said, management sounded optimistic about the growth opportunities within its AZ and CO markets. While growth in C&I should see continued momentum, management noted increased competition around pricing as banks tapped out of the CRE markets look to make C&I loans. On CRE, GWB sees itself as a potential beneficiary from pullback by some of its competitors. While management was generally constructive of the

HOUSE_OVERSIGHT_014333

CRE market across its footprint it noted some caution around the health of the market in Denver.

Chart 31: What is the primary reason keeping you from buying/increasing exposure in GWB?



Source: BofA Merrill Lynch Global Research

- **Ag portfolio offers unique opportunity, but management believes fears overstated**. As of 3Q16, ag loans represented 25% of the total portfolio (36% in grains, 50% in proteins and 14% in other). Tied for first at 38% as a reason why investors are hesitant to increase exposure to GWB resonates from the bank's ag exposure. While lower grain prices may constrain cash flow on those loans near-term, Mr. Chapman noted that this is offset by stronger yields. Management also highlighted the relatively low losses observed historically in this portfolio given the significant experience within GWB's management ranks in lending to this segment, including in the 1980s the last stress period for the farm sector. That said, management remains committed to this business as it is key to GWB's footprint.

- **Management reiterated its commitment to actively manage excess capital**. Although management is comfortable with its current capital levels (3Q: 9.5% tier 1 leverage), Mr. Chapman noted the bank's preference is to put its excess capital to work. Management reminded investors of the criteria it looks for in a potential target. While they continue to look for opportunities within their footprint, specifically IA and KS, they remain disciplined. In addition to its recently authorized repurchase program of $100mn, management believes a total payout ratio of 30% is maintainable.

IBERIABANK (IBKC), B-1-7, Buy

- **Focused on moving closer to its strategic targets**: President and CEO Daryl Byrd and Senior Vice President John Davis were upbeat around the outlook for economic growth across IBKC's 10 state footprint as the bank looks out into 2017. While management has thus far not provided any specific guidance for 2017, we expect this to be forthcoming in conjunction with the announcement of 4Q16 results in January. Moreover, management sounded cautiously optimistic that pro-growth policies (if implemented) coupled with some relief on the regulatory front under the new Trump administration could lead to a much stronger growth outlook

- **Energy credit costs should trend lower**: Management noted the overall energy portfolio should continue to trend lower but is expected to moderate as run-off in stressed energy loans (and loan payoffs) are partially offset by new energy loans, with management looking to selectively lend again in the sector. Moreover, with energy criticized loans peaking in 1Q16, management expects the criticized loans to trend lower barring any major declines in oil prices.

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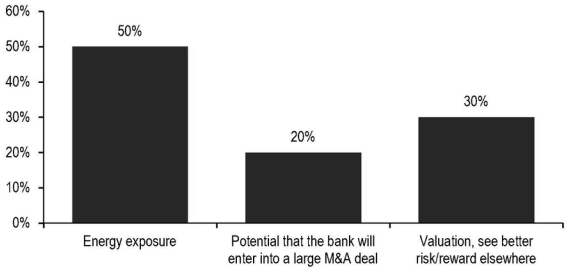
- **Ready for M&A**: While a depressed valuation (due to the volatility surrounding oil prices) had kept IBKC out of M&A, given the recovery in valuation it noted its desire to pursue potential deals across its footprint. Management also noted that while the recent move in equity markets had pushed up valuations for potential publicly traded sellers, it sees significant opportunity among the privately held banks that may look for a merger partner to gain liquidity and monetize the improving sentiment surrounding bank stocks. From a size standpoint, management did not rule out larger deals. This is not surprising given that IBKC has not shied away from pursuing relatively large sized deals previously.

- **Rate increase to boost the margin**: In terms of its interest rate sensitivity, management noted that it retains an asset sensitive balance sheet, with a potential 25 basis point move in the Fed Funds rate expected to add 5c to quarterly EPS. That said, management recognized that slower mortgage activity due to rising long rates could temper the revenue outlook for its mortgage business.

Chart 32: What is the biggest factor that prevents you from owning or adding exposure to IBKC?



Source: BofA Merrill Lynch Global Research

JPMorgan Chase & Co (JPM), B-1-7, Buy

- **Pent up demand from macro uncertainty offers growth opportunity**. Doug Pento, CEO of JPM's Commercial Bank, sounded optimistic around the opportunity within commercial banking from the pent-up demand in the market that was constrained by the uncertainty surrounding the election. In addition, he highlighted the increased opportunity generated by JPM's expansion into 44 new markets since 2008, specifically in LA. This coincides with 62% of the audience polled who believe top-line revenue growth is most important for the stock to continue its outperformance.

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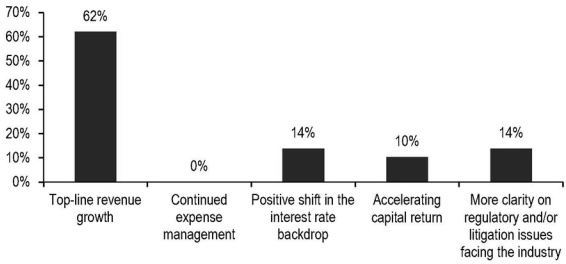
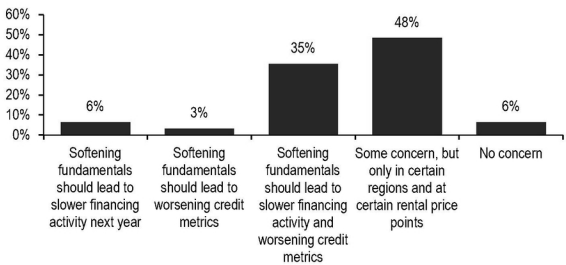
Chart 33: As a current or prospective JPM shareholder, what do you think is most important for the stock to continue its outperformance next year?



Source: BofA Merrill Lynch Global Research

- **JPM cautious on CRE; however, overall credit remains benign**. Forty-eight (48%) percent of the audience polled believe concerns around multi-family fundamentals will be concentrated in certain regions. Although credit for the overall bank remains benign, Mr. Petno believes we are in the later stages of the real estate cycle and expressed a cautious tone on the high-end condo/construction market. That said, JPM is primarily exposed to more stable, multi-family credit (i.e. rent-controlled apartments) where the average loan to value is 60%.

Chart 34: How do you view fundamentals for multifamily lending in 2017?



Source: BofA Merrill Lynch Global Research

- **With tech/digital intellectual property at fingertips, capabilities within CB are on horizon**. Mr. Pento expressed his intention to leverage the technology that the Investment Bank has and the investments that the Consumer Bank has to build the right digital and mobile platforms for the bank's commercial clients. He noted that they have the largest investment and digital budgets ever this year and expect it to increase next year.

New York Community Bancorp (NYCB) C-1-8, Buy

- **Completion of Astoria acquisition best outcome for both banks:** Following the recent announcement of a regulatory delay in getting approval for the Astoria acquisition, NYCB CEO Joe Ficalora and CFO Thomas Cangemi reiterated that closing the Astoria deal represents the best outcome for both banks. Beyond that management was limited in its ability to talk about what particular factors led to the delay and refrained from providing a specific timeline to close the deal assuming that the BoDs at both banks agree to extend the deal deadline beyond

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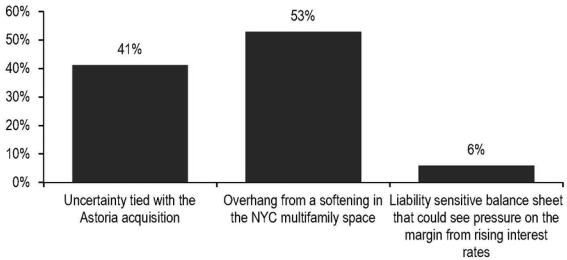
YE16. Management was quite clear that the bank was unlikely to cross the $50bn SIFI asset threshold on an organic basis until the SIFI threshold is moved higher, which would take an act of Congress.

Chart 35: What is the biggest risk that prevents you from owning/increasing exposure to NYCB?



Source: BofA Merrill Lynch Global Research

- **Regulatory relief would be meaningful for NYCB:** Given that the prolonged timeline for gaining regulatory approval for the Astoria acquisition can be attributed to the pro-forma entity crossing over the $50bn SIFI asset threshold, management noted the significant relief it would receive from legislative action that would push this threshold higher. This would not only make the regulatory burden following the closing of the Astoria acquisition more manageable, but would also allow NYCB to look at additional M&A opportunities once it integrates Astoria. Moreover, any potential relief on LCR compliance would also be welcomed by management as it would remove a source of significant pressure on its net interest margin.

- **Higher rates could accelerate refinance activity:** While investors tend to view rising rates as a headwind to refinance activity, management noted that it had already seen a pick-up in applications as borrowers look to lock-in rates based on the fear that rates could be significant higher 6-12 months out. As a result, this could provide a near term boost to the margin from higher prepay income.

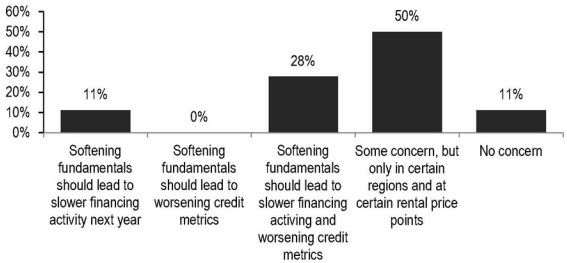
- **Steepening yield curve leading to rising lending rates:** Management noted that it had recently increased its multifamily coupon by 0.375% to 3.50% on the improved interest rate environment. NYCB was not alone in this rate hike as SBNY commented that it recently moved up lending rates for its 5-year and 7-year fixed multi-family loans. Notably, the increased lending rates are above the current book yield of NYCB's loan book implying the potential to offset some of the potential pressure from higher funding costs following the December rate hike.

- **NYCB able to withstand downturn in multifamily market:** Management was also upbeat on its ability to withstand a downturn in the multifamily market given its history through multiple credit cycles of outperforming on credit metrics. While it is debatable how close we are to the next downturn, we believe that the defensibility of NYCB's balance sheet is a key strength of the bank and should create significant

HOUSE_OVERSIGHT_014337

organic and M&A driven growth opportunities during the next downturn. That said, management noted that it was very likely that potential pro-growth measures taken by the incoming Trump administration could push out any downturn, as in the short run the economy would witness stronger growth.

Chart 36: How do you view fundamentals for multifamily lending in 2017?

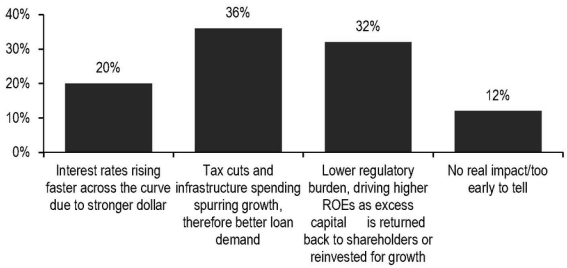


Source: BofA Merrill Lynch Global Research

Regions Financial (RF), B-2-7, Neutral

- **Regions harnessing consumer to drive growth**: Scott Peters, Senior EVP and Consumer Services Group Head, Logan Pichel, Consumer Lending Group Head, and Darren Smith, Treasurer, noted that Regions is utilizing its retail platform to drive growth. Management highlighted strength in mortgage, card, and online lending as avenues for growth. Importantly, management felt the US election has provided tailwinds for Regions revenue growth prospects heading into 2017. Combined with a better rate back drop, management sounded upbeat on its outlook.

Chart 37: What do you think is the biggest impact of the GOP sweep to bank earnings?



Source: BofA Merrill Lynch Global Research

- **Multiple channels to drive loan growth:** Management illustrated several avenues for loan growth. Within mortgage, Regions has 450 originators that generate 95% of its $6bn in annual originations. Management is seeking to increase its originations from home loan direct and telephone banking to 15-20% of total originations (currently 5% of originations) given the greater profitability from these channels. Card growth has also been strong with active credit card growth at 12%

Bank of America Merrill Lynch

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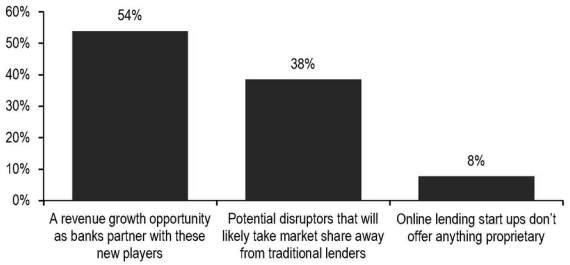
YoY and card penetration reaching 20%. Importantly, management is utilizing online lenders like GreenSky, a nationwide point-of-sale home improvement business, to drive growth as balances having increased to $660mn (1% of loans) from its 2014 inception. Of note, management expects challenged growth in auto, though its exclusive lending to the prime space limits the credit downside.

Chart 38: How do you view the impact of new online lending startups on the banking industry?



Source: BofA Merrill Lynch Global Research

- **Possible tailwind from regulation**: Management at Regions noted that while it is still uncertain how the regulatory landscape will evolve, a more favorable environment could allow Regions to free up investments tied to regulatory initiatives and risk management. Management would likely direct these funds to product development and customer initiatives.

- **Asset sensitive, particularly to the long end**: Regions' executives noted its highly asset sensitive balance sheet given the more favorable rate back drop since 3Q. According to management, a 100bp parallel shift in the yield curve produces ~$175mn in incremental spread revenue (11% of '17e operating income) with two-thirds of the impact coming from the middle to long end of the curve. Part of the benefit of a rate rise is derived from lower premium amortization on its investment portfolio from higher rates. Given the steepening of the yield curve, we expect Regions to benefit more than peers.

- **Branch network continuing to evolve:** Management intends to increase the productivity of its branches through several measures. Firstly, it is designing smaller, more visible locations to drive traffic. Management is also implementing the universal banker model, which has already resulted in 500 fewer tellers, in order to increase revenues at branches. Management noted that it expects to consolidate at the higher end of its expected 100-150 branch reductions, having already identified 90 branches for closure.

Signature Bank (SBNY), B-1-9, Buy

- **Focused on $4-6bn asset growth target**: President & CEO Joe DePaolo & EVP Eric Howell sounded fairly optimistic about the outlook for balance sheet growth with $4bn in loan growth and $4.6bn in deposit growth YTD as of 9/30 vs. management target for $4-6bn in annual asset growth. Management reiterated that the fundamentals of the multifamily business (which is focused on the low-to-moderate

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income segment) have not changed despite the headlines surrounding a softening in the multifamily space.

- **Hiring bankers, even as team hiring on pause**: On the hiring front, management noted that although it does not expect to hire teams heading into year-end, it is continuing to hire individual bankers (recently hired 4 to 5 lenders). Hiring will be focused on C&I and specialty finance lenders. Management does not expect to hire additional CRE lenders.

- **Easing in regulatory environment could provide some relief on expense growth**: With regard to the potential for some easing of regulatory burden on the banks (important here as SBNY approaches the $50bn asset threshold) under the incoming Trump administration management noted that it could see some abatement in expense growth associated with compliance costs. However, management is running the business based on the current regulatory framework and will look for more tangible signs before it makes any changes to investment decision, especially as it relates to the compliance infrastructure.

- **Lending rates reflecting the steepening in the yield curve**: SBNY noted that it had raised rates on its 5-year fixed by 0.125% to 3.5%- 3.625% and 7-year fixed up by 0.25% to 4.0%-4.125% following the steepening in the yield curve over the last week. We note that this was echoed by SBNY's NY rival NYCB which also noted increasing rates on lending products in the aftermath of the move higher in interest rates. We believe higher rates associated with new loans and better reinvestment opportunities in the securities portfolio should serve as a tailwind to the margin even as funding costs will likely trend higher, especially as the Fed raises interest rates by 25bp in December.

- **Regulatory scrutiny on multifamily lending manageable**: With regard to the heightened regulatory concerns surrounding CRE multifamily lending (multifamily is 50% of SBNY's loan book), management noted that it has implemented a new loan system likely coming on line in 3Q17 which should allow the bank to analyze the loan portfolio at a more granular level. Management is also underwriting fewer interest only multifamily loans in response to the regulatory concerns. Although, it noted that it was not losing any significant business due to this as competitors had also pulled back and borrower ability (in most instances) to service a non-interest only loan.

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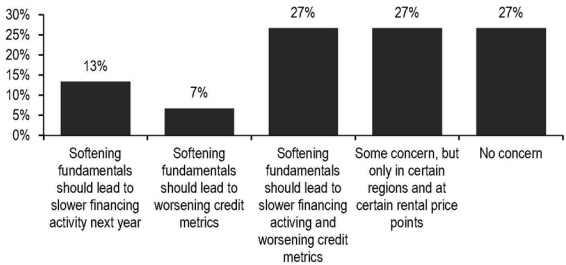
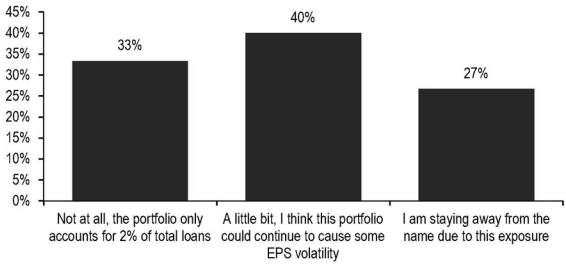
Chart 39: How do you view fundamentals for multifamily lending in 2017?



Source: BofA Merrill Lynch Global Research

- **Confident past most of taxi medallion issues**: Management expressed confidence that it has taken care of most of the issues on its Chicago taxi medallion loan book and is seeing stabilization of its New York book with New York fleets near 100% utilization. Management also expects the $20mn +/- in quarterly provisioning outlook to absorb the impact from any incremental provisioning associated with the medallion portfolio.

Chart 40: How much does SBNY's taxi medallion exposure impact your decision to invest in the stock?



Source: BofA Merrill Lynch Global Research

Synovus Financial (SNV), C-2-7, Neutral

- **SNV hesitant to react too quickly to post-election excitement**. Chairman and CEO Kessel Stelling noted that despite the very positive reaction seen in bank stocks from the results of the US elections, it was too soon to say the real impact on growth outlook. That said, he believes that a more encouraging business climate (i.e. increased infrastructure spending) as well as some regulatory relief (i.e. raising the $50bn asset threshold) could be a benefit for SNV and the overall industry.

- **SNV could see a benefit at both ends of a steepening yield curve**. As of 3Q16, 50% of SNV's total loan portfolio was fixed rate (includes variable rate loans with floors), implying a benefit to spread income from a rise in both the short- and long-end of the yield curve. With the futures market now pricing in a 94% probability the Fed raises rates in Dec., CFO Kevin Blair believes the net interest margin could expand by 6bp in from a 25bp rate hike (vs. +9bp last year). That said, the benefit is

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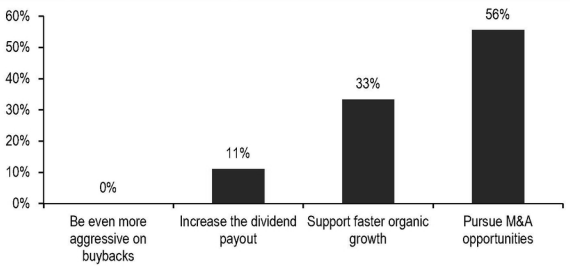
dependent on what happens with deposit costs. SNV's current sensitivity analysis assumes a 50-60% deposit beta.

- **SNV keenly focused on credit**. Chief Credit Officer Kevin Howard noted expectations for net charge-offs to naturally tick up as recoveries become less of a benefit and some seasoning in the loan portfolio. Recall during its earnings call, management lowered its FY16 net charge-off range to 10-20bp (3Q: 12bp). Mr. Howard noted that he would not be surprised if NCOs increased to 15-20bp in 2017 (cons: 12bp) and stay near those levels for the near future.

- **Management reiterated its intent to continue to deploy excess capital**. Although SNV will disclose a more detailed capital plan in January, management expects to continue deploying excess capital via buybacks, M&A and/or organic growth. When asked how management should utilize its excess capital, 56% of the audience polled prefers SNV pursue M&A opportunities (vs. 8% last year). In reaction, Mr. Stelling noted continued interest in strategic acquisitions (like Entaire) but hesitant to execute a large, dilutive transaction. While DTA accretion could allow for continued share repurchase, management may choose to be a bit more opportunistic around buybacks given the run up in the stock.

Chart 41: What would you like to see management do with its excess capital?



Source: BofA Merrill Lynch Global Research

- **Management is positive but cautious on online lending partnerships**. Investors were also relatively split in how they view SNV's partnerships with online lenders SoFi and GreenSky. The majority (57%) remains cautious on how these loans will perform during a credit cycle. Mr. Stelling agreed; however, he believes these partnerships represent the right vehicle to help the bank grow its retail portfolio to 20-25% of loans (in line with its strategy to transition away from CRE) and achieve its 1.0% ROA target (3Q: 0.88%). Although we note that SNV is being deliberate around growing this book and is targeting these loans to grow to approximately 2-3% of total loans.

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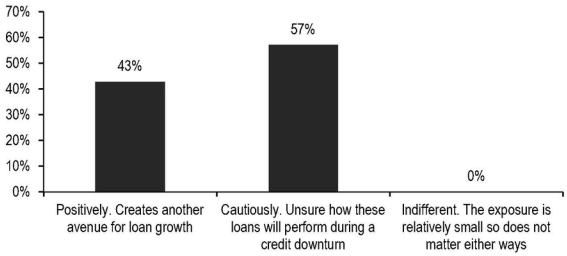
Chart 42: How do you view SNV's partnerships with online lenders (SoFi/GreenSky)?

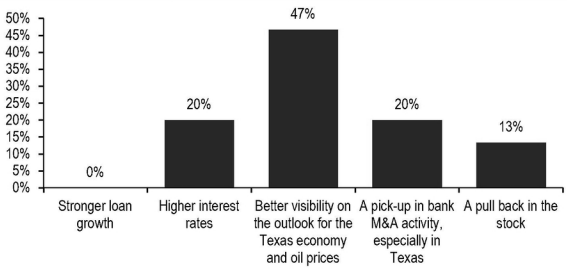


Source: BofA Merrill Lynch Global Research

Texas Capital Bancshares (TCBI) C-2-9, Neutral

- **Upbeat on business outlook**: TCBI's President & CEO Keith Cargill, CFO & COO Peter Bartholow, CAO Julie Anderson, and CLO Vince Ackerson were relatively upbeat about TCBI's business outlook. Management expects its mortgage businesses, particularly MCA to be to be a source of strength even if overall mortgage volumes were to slow down due to the rise in interest rates. Management expects to mitigate the negative impact from lower mortgage activity by picking up greater wallet share of existing clients and given the option to bring back to the balance sheet loan participations. Regarding expenses, despite expectations for an uptick in the efficiency ratio over the next couple of quarters management expects to beat its 2016 efficiency guidance (low-to-mid 50s).

Chart 43: What would drive you to buy or increase your positioning in TCBI?



Source: BofA Merrill Lynch Global Research

- **Credit provisioning likely to trend lower in 2017**: During an investor poll, nearly half of investors expect credit provisions to be lower in 2017 vs. 2016, based on expectations for stabilization in oil prices. Management expressed comfort that reserve levels should be adequate even if oil prices were to decline to the mid-to-high $30s in the near term (vs. spot WTI prices of $45/bbl today). However, management would need to consider increasing its reserve level if oil falls to the high $20s. Conversely, if oil stabilizes in the high $50s-low $60 levels, management could consider reserve releases. Management stressed on looking at the forward curve when assessing the impact from oil prices on credit costs vs. the spot rate.

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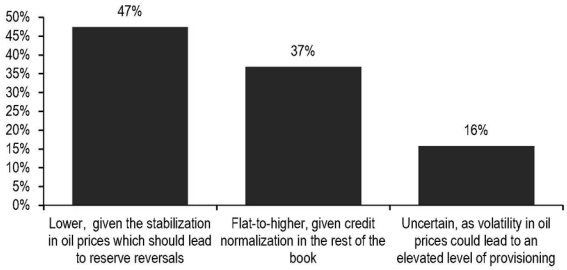
With regard to growth in the energy book management expects balances to stay relatively flattish as new growth is offset by pay downs and deleveraging.

Chart 44: Where do you see TCBI's provisioning in 2017 relative to 2016?



Source: BofA Merrill Lynch Global Research

- **Mortgage growth to continue despite a downshift in activity**: Management was optimistic on the outlook for both its mortgage businesses – warehouse lending and MCA businesses Management expects both these portfolios in aggregate to total 28-33% of average total loan portfolio. Management tried to debunk the perception that the MCA business was cannibalizing its warehouse lending business and noted that two business were complimentary in nature. Moreover, while initially the vast majority of the MCA customers were the ones that TCBI had a relationship on the warehouse lending side, it noted that that number had fallen to 50% and is likely to move lower over the coming quarters. TCBI has a dedicated sales force prospecting for the MCA business.

- **Next rate hike to give a bigger boost to EPS**: Management noted its high asset sensitivity with most of their loans tied to LIBOR and prime and its expectations for an increase in funding costs to remain relatively tempered. With strong demand deposit growth during the year and a $1bn reduction in loans with floors (from $3.1bn to $2bn), TCBI has become more asset sensitive relative to last year, when a rate hike led to a $4mn increase in spread income. Management expects a Dec rate hike to boost spread income by more than $4mn a quarter.

- **Remains cautious around CRE lending**: Management noted that it intends to grow CRE more slowly as it de-risks the portfolio and until it sees a turn in the cycle. However, management is optimistic on the credit quality of CRE, particularly noting that trends in its Houston real estate portfolio (Houston special mention loans are 1% of Houston CRE) continue to be fairly benign.

US Bancorp (USB), B-2-7, Neutral

- **Strong growth outlook across the business spectrum**. CEO Richard Davis provided an upbeat view around the outlook for the economy across the business spectrum ranging from small businesses to large corporates and noted that businesses could drive the economic recovery vs the consumer side.

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- **Continued investments in regulatory costs despite potential regulatory relief**. On the topic of regulation, management noted that it is still too early to know what type of regulatory relief banks of USB's size may receive so management has not slowed down any of its investments in regulatory costs.

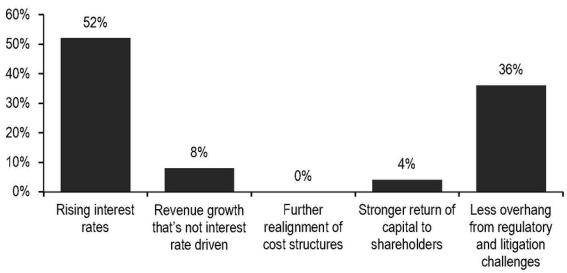
- **Long term 13.5- 16.5% ROE target unchanged**. Despite the outlook for higher rates, management noted that it was not going to change the range at this point of time but noted that USB could reach the top end sooner than later if its outlook proves accurate.

- **Risk management compliance expenses sustaining at this level**. Management noted that while compliance related expenses could trend lower following the new administration, it will continue to invest and the impact will likely not be meaningful.

- **In terms of innovation projects, 86% of those polled noted that it should invest in innovations projects that are self-funded.** Davis noted that given the importance of innovation, it would not just self-fund those expenses and would look to spend money for long term benefits. In terms of its P2P initiative with Zelle, Davis was optimistic around its growth.

- **In terms of potential M&A, management noted that it would look for in market opportunities and double down where it has scale**.

Chart 45: What do you consider to be the most important catalyst for large-cap banks in 2017?



Source: BofA Merrill Lynch Global Research

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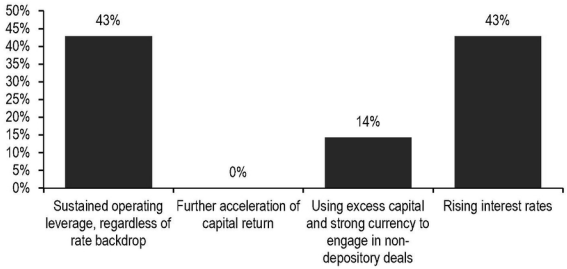
Chart 46: What do you consider to be the most important catalyst for USB in 2017?



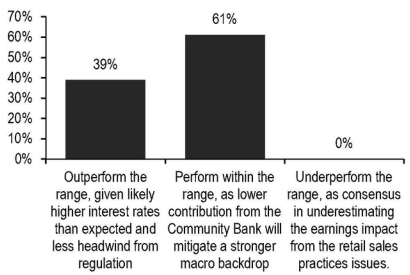
Source: BofA Merrill Lynch Global Research

Wells Fargo & Co (WFC), B-1-7, Buy

- **WFC sees modestly better benefit from steepening yield curve vs parallel shift**. Following the election, the 10yr yield is up 37bp while futures currently imply a 94% probability the Fed raises rates in Dec. As such, Treasurer Neal Blinde noted that WFC could realize a modestly better benefit to spread income from a steepening yield curve vs. the current +$150mn/qtr expectation from a 25bp parallel shift. He outlined how the bank's actions to manage an interest rate cycle via balance sheet positioning protect on the downside (i.e. post-Brexit) while at the same time allow for an uptick when rates rise. WFC received numerous investor questions on when they would deploy its dry power ($572bn in liquidity), and management noted that the rate backdrop – not question marks on deposit duration – mostly drove deployment decisions.

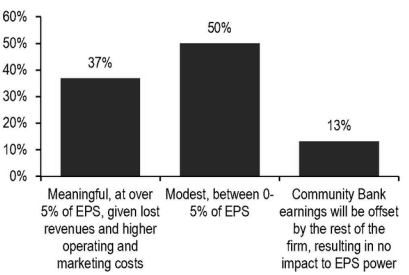
- **WFC reiterated its performance targets disclosed at its Investor Day**. WFC reiterated its 2-yr performance targets: **(1)** 1.1-1.4% ROA; **(2)** 11-14% ROE; **(3)** 55-59% efficiency ratio; and **(4)** 55-75% net capital payout. As of 3Q16, the bank is currently within these ranges on all metrics except for efficiency (3Q: 59.4%). This is consistent with the 61% of the audience polled that expect WFC to perform within the targeted ROE range as headwinds from Retail Banking is offset by an improvement in the macro-economy. That said, 50% of the audience polled believe the issues arising from the retail sales issue will modestly impact earnings (0-5%).

Chart 47: Based on your post-election outlook for 2017, how do you think WFC will perform against this 2 year target?



Source: BofA Merrill Lynch Global Research

Chart 48: What do you think is the earnings impact of the retail sales practices issue?



Source: BofA Merrill Lynch Global Research

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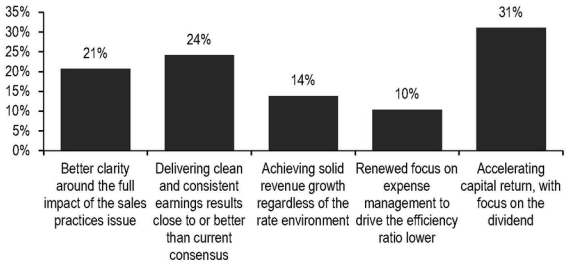
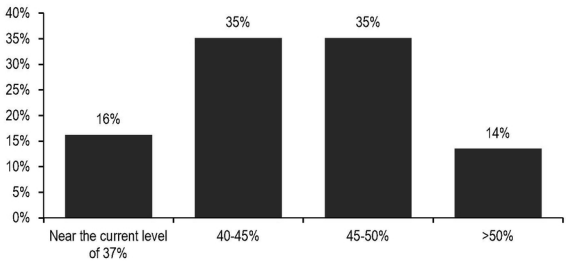
- **WFC continues to make progress on regulatory compliance**. As of 3Q, WFC's current total loss absorbing capacity (TLAC) shortfall was 2.1% of risk weighted assets or $29bn ($43bn including its internal buffer), an $8bn QoQ improvement. That said, Mr Blinde assured investors that WFC will continue to focus on deposit growth (66% of total funding) even as its long-term debt needs continue. WFC is compliant with the liquidity coverage ratio (LCR).
- **Potential changes to annual stress test process viewed as positive**. Mr. Blinde noted that potential changes to the annual stress test process, as proposed by Gov. Tarullo in Sept., is a "real" positive, specifically as it reduces any variance between how the stressed risk weighted asset balance is calculated. This is likely positive for the majority of investors polled (31%) who think capital return is the biggest catalyst for the stock and the (70%) who see the dividend payout growing towards the 40-50% range long-term (currently 37%).

Chart 49: What do you think is the biggest catalyst for WFC shares over the next 12-24 months?



Source: BofA Merrill Lynch Global Research

Chart 50: As a result, what do you think WFC's long-term dividend payout ratio will be?



Source: BofA Merrill Lynch Global Research

- **Note**: WFC is scheduled to report October customer activity in Retail Banking on Thur, Nov. 17th at 9am ET.

Zions Bancorporation (ZION), C-3-7, Underperform

- **Sentiment post-election appears constructive on growth prospects**. Consistent with other bank management teams speaking at this year's conference, CFO Paul Burdiss noted that small businesses have been reluctant to invest given the

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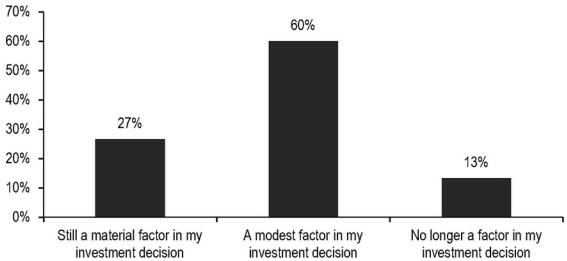
uncertain macro backdrop. That said, following the results of the election, and assuming the new administration can create fiscal stimulus, management sounded optimistic around growth prospects in C&I (10% ex-energy YoY), owner-occupied, etc.

- **Energy portfolio performing in-line with expectations**. Management reaffirmed the >8% allowance on its energy portfolio ($2.3mn or 5% of total loans) remains sufficient to cover future losses. However, continued stress in its oilfield services portfolio (26% of portfolio) remains the primary reason behind ZION's cautious view. This was consistent with the 60% of the audience polled whose ownership in the stock is modestly influenced by this portfolio. That said, until supply/demand fundamentals improve or activity picks up, material reserve release is unlikely.

Chart 51: How much does credit quality in ZION's energy portfolio influence your decision on owning the stock?



Source: BofA Merrill Lynch Global Research

- **Steepening yield curve a modest benefit, though short-end matters more**. Despite recent actions that have reduced the bank's asset sensitivity, ZION remains the most asset sensitive among US banks. For a 25bp rise in the short-end, ZION estimates a $30mn incremental benefit to spread income. That said, due to the variable-rate mismatch between assets/liabilities, a steeper yield curve is expected to have a marginal impact.

- **Potential changes to CCAR viewed as positive for ZION**. Mr. Burdiss viewed the potential change to the annual stress test (CCAR), specifically the static RWA balance, as net positive for the bank/industry. That said, overall these changes are immaterial as CCAR remains their capital constraint. Although only 14% of the audience polled think more aggressive capital return is the most important catalyst for the stock (top response: 29% for stronger revenue growth), investor bias leaned higher as it relates to total payout.

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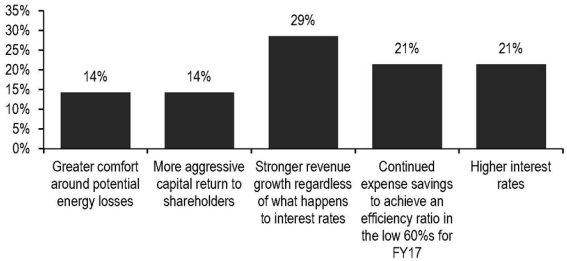
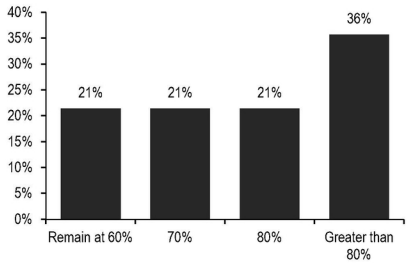
Chart 52: What do you consider as the single most important catalyst for ZION shares in 2017?



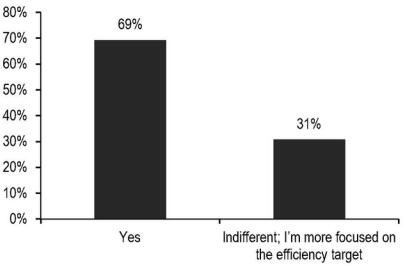
Source: BofA Merrill Lynch Global Research

Chart 53: Compared to this year's CCAR capital ask which implies a total payout of ~60%, what level would you like to see ZION's 2017 CCAR payout increase to?



Source: BofA Merrill Lynch Global Research

Chart 54: ZION expects total expenses in 2016 to come in below $1.58bn and then slightly increase in 2017. Would you prefer absolute expenses be flat to down in 2017?



Source: BofA Merrill Lynch Global Research

Brokers Top 5 Takeaways

Goldman Sachs (GS), B-1-7, Buy

- GS' Harvey Schwartz, CFO, and Harit Talwar, Head of Digital Finance presented at our conference. Overall, Harvey and Harit were optimistic about the consumer lending opportunity with Marcus as well as the overall outlook for the firm.
- When asked about what would get investors more interested in GS stock, 51% of the investors responding to the poll voted for a stronger revenue backdrop, while 34% voted for normalizing regulations and ability to return more capital.

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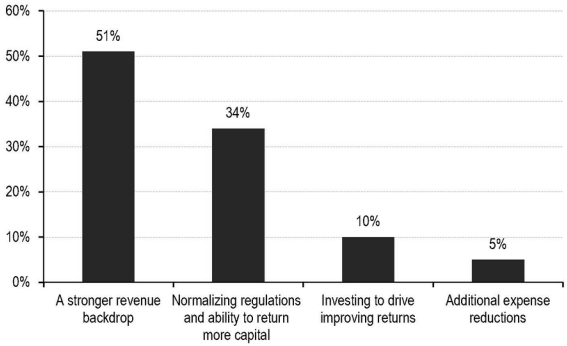
Chart 55: What would get you more interested in investing in GS stock?



Source: BofA Merrill Lynch Global Research

- Management focused the presentation on Marcus, Goldman's new consumer lending effort. This venture has significant potential with an unsecured consumer loan target market of $850B and Goldman coming to the market with a unique skillset of technology and risk management, no channel conflicts or bricks and mortar, a strong balance sheet that can provide loans at a meaningful discount to peers, and a long history in the financial markets with a strong brand. When fully ramped up, this unit could produce pre-tax ROA's of 3-4%, and assuming 9-11% equity commitments, this could translate into a high teens ROE.

- Given the positive sector/GS stock reaction post the election, management was asked on what they thought about the future of current regulation and activity levels. While they said it is too early to tell the impact, a lower corporate tax rate would benefit GS some, a pro-growth policy could positively impact confidence/activity levels, and some de-regulation could ease some of the operational challenges, though much of the regulation was well intended and has created a stronger industry.

- In terms of the current environment, GS didn't give an exact update, but said activity has been healthy and around the election activity was similar to around Brexit (slow before and very active post). Most other firms also mentioned positive trends in 4Q, with normal seasonality, but up materially year over year.

Asset Managers Top 5 Takeaways

Invesco (IVZ), C-1-7, Buy

- Presenting from IVZ was Loren Starr, CFO. Overall Loren was optimistic on the outlook for IVZ to generate above average organic growth given its product mix and performance, deliver cost savings, and accelerate buybacks, and does not expect a significant change in the DOL impact from the election.

- When asked what would get investors more excited about investing in IVZ stock, the majority of respondents said that a consistent above average organic growth rate would get them most excited (48%), followed by a more favorable market backdrop (38%), less regulation (10%), and more operating leverage (5%), while nobody said longer term FX hedged would get them more interested.

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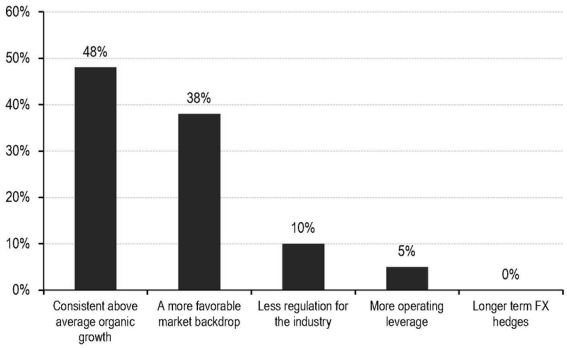
Chart 56: What would get you more interested in investing in IVZ stock?



Source: BofA Merrill Lynch Global Research

- IVZ is confident it can achieve its 3-5% organic growth rate driven by three main pillars. The first being the ongoing search for yield driving fixed income flows/allocation which IVZ has benefitted from and should continue to benefit given their strong performance, distribution, and product set. The second being ongoing "barbelling" by clients which drives flows into passive and alternatives, two products IVZ has leadership in. Lastly, IVZ sees opportunity in its institutional channel, particularly in Asia which has had notable momentum.

- Given the run up in rates, IVZ touched upon its fixed income exposure and what might be at risk of underperformance/outflows. IVZ mentioned roughly $100B of its AUM or ~13% was in fixed income that didn't include short duration or floating rate, a number they feel is relatively small compared to some of its peers. Additionally, within that $100B a major portion had been underperforming because of strategic shorter duration, which in a rising rate environment should lead to outperformance and potentially negate some of the flow headwind.

- Regarding potential changes from the election, while very early, management thinks that whatever happens to the DOL Fiduciary Rule (delay, modify, etc.), the industry has already been shifting in a fiduciary direction, and they expect that to continue, though the pace could vary depending on the eventual outcome. Additionally, IVZ is relatively well positioned given its diversification among ETF/passive and active strategies, as well as similar regulations in Europe that it has managed through. In terms of a lower corporate tax rate, that would not have much impact to IVZ given its Bermuda domicile.

Eaton Vance (EV), B-3-7, Underperform

- Presenting from EV was Thomas Faust, CEO, Laurie Hylton, CFO, and Dan Cataldo, Head of IR and Treasurer. Management reported relatively positive F4Q flows, expects organic growth to hold up well given its mix and performance, and does not expect a significant change in the DOL impact from the election, but would expect a significant benefit from a lower US corporate tax rate.

- When asked what would get you more interested in EV's stock, the majority of investors were fairly split between better high fee flows and ETMFs taking off (38%/31% respectively). Investors also thought increased capital return was

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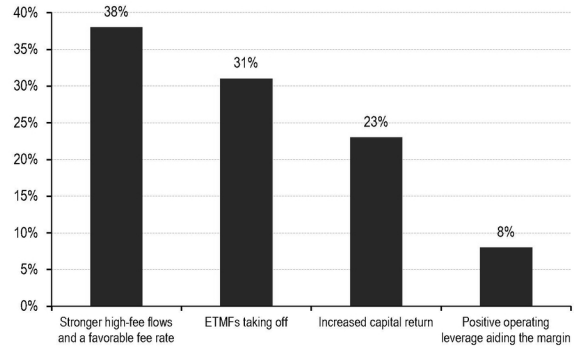
important (23%) while investors thought more operating leverage was least important for EV (8%).

Chart 57: What would get you more interested in investing in EV stock?



Source: BofA Merrill Lynch Global Research

- EV disclosed their F4Q AUM which was $336.4B up modestly from $334.4B at the end of its prior quarter as modest market losses were offset by inflows which were also disclosed by EV. Flows for C3Q (F4Q) were $4.8B/6% aog or $1.7B/3% aog ex exposure management flows, roughly in-line with expectations in a fairly challenging backdrop. EV also commented on their recent acquisition of Calvert Investments (~$12B AUM, see note) and is excited about the opportunity in ESG investing. Calvert is a leader in investing in socially responsible companies, a small but rapidly growing area.

- When asked about the outlook on fixed income performance and flows given the recent run up in rates as well as the outlook, EV was fairly positive in their outlook given their positioning and leadership in floating rate which should perform well and attract flows in a rising rate environment.

- ETMFs continue to be topical for EV given they are the only player in the non-transparent active ETF business with their NextShares franchise. EV has launched 3 NextShares thus far and Waddell and Reed launched 3 of their own in October, making 6 total NextShares in the market right now, however they are only available through Folio and Interactive Brokers. While we continue to view this as not very significant in the near term and a potential longer term opportunity, with EV signing on UBS and Envestnet for distribution in 2017, we should see a little more traction ahead.

- Regarding potential changes from the election, while very early, management thinks that whatever happens to the DOL Fiduciary Rule (delay, modify, etc.), the industry has already been shifting in a fiduciary direction, and they expect that to continue, though the pace could vary depending on the eventual outcome. Additionally, EV has limited exposure to higher distribution share classes (<20% of sales), so they see a more limited impact. In terms of a lower corporate tax rate (15-20%), this would have a meaningful benefit for EV, potentially increasing earnings by 15-20%.

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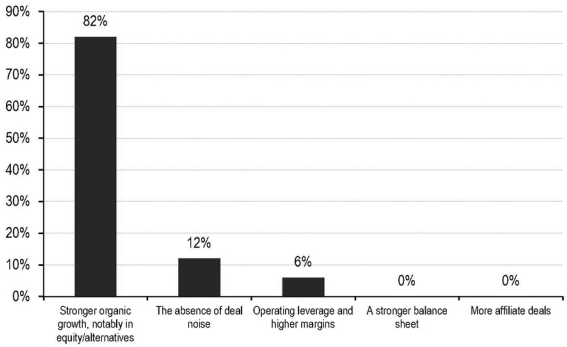
Legg Mason (LM), C-1-7, Buy

- Presenting from LM was Joe Sullivan, Chairman & CEO, and Alan Magleby, Head of IR. Joe was optimistic on the flow outlook for LM given the repositioning over the past few years, mostly favorable investment performance, and a healthy institutional pipeline, and does not expect a significant change in the DOL impact because of the election or a lower corporate tax rate on their cash tax rate.

- When asked what would get you more interested in investing in LM stock, investors overwhelmingly (82%) replied "strong organic growth, particularly in equity/alternatives" while the absence of deal noise (12%) and higher margins/operating leverage (6%) were less interesting for investors. Nobody said that a stronger balance sheet or more affiliate deals would get them more excited about LM's stock.

Chart 58: What would get you more interested in investing in LM stock?



Source: BofA Merrill Lynch Global Research

- LM was relatively upbeat on the flow outlook, despite some ongoing headwinds for the industry. Management sees the following drivers offsetting some of the industry headwinds to position LM to flow better than the industry: strong investment performance, notable progress with consultants over the last several years, a healthy institutional pipeline ($8B of unfunded wins/$3B uncalled committed capital), highest level of search activity in active equity in several years, large cash balances in Europe (20-50% cash allocation across the continent), increasing demand for real estate / infrastructure / alts (Clarion, RARE, and EnTrustPermal), and a diverse / differentiated product/vehicle set.

- Management also mentioned that besides offering well performing products across strategies, it also wants to be able to deliver to clients in different vehicles, including ETFs. The firm has been launching some ETF products and also has an interest in Precidian, which has its non-transparent ETF submission under the review process.

- Regarding potential changes from the election, while very early, regarding the DOL fiduciary rule, LM sees it getting delayed and watered down some as the most likely outcome. However, they mentioned the fiduciary rule was just an accelerant for trends that were already occurring (i.e. the shift to fee based accounts and away from brokerages) and whether or not the rule goes through as expected or gets

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modified will not likely change the outlook. LM feels its strong positioning in global distribution and product sets bodes well to perform in a new fiduciary world.

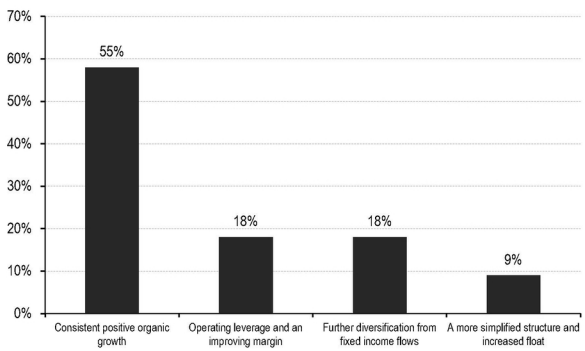
- Additionally, a lower potential U.S. corporate tax rate will not change its cash tax rate which is likely to be 6-7% through 2021 and in the mid-teens through 2025 after that. However, it would impact GAAP EPS and a lower corporate tax rate would lower the value of LM's DTA.

AB (AB), B-1-8, Buy

- Presenting from AB was Peter Kraus, Chairman & CEO. Peter expects AB to generate above average organic growth and hopes to accelerate it given its product mix and mostly favorable investment performance. In addition, he sees the potential for new pricing in the industry, and does not expect a significant change in the DOL impact from the election or a lower corporate tax rate on their tax rate.

- When asked what would get you more interested in AB's stock, 55% of investors said they wanted to see consistent positive organic growth, 18% said a better operating margin, another 18% said diversification from fixed income flows (i.e. equity and alternative flows), and only 9% of investors wanted to see a simplified structure and increased float.

Chart 59: What would get you more interested in investing in AB stock?



Source: BofA Merrill Lynch Global Research

- AB has seen and expects to continue to see above average organic growth (ex 3Q which was weighed down by lumpy institutional outflows) given a relatively new and attractive product set, strong investment performance (notable improvement in recent years), better traction with the consultant community, and opportunities to gain in the retail and private wealth channels.

- Regarding potential changes post the election, AB had a similar tone to other asset managers on DOL, in the sense that it likely gets delayed/modestly modified, but regardless of what happens, asset managers and distributors need to accept that the industry is living in a new fiduciary world with minimized (potentially no) conflicts of interest which ultimately is a good thing for end clients. A lower potential corporate tax rate would not likely benefit AB given its tax structure/low current tax rate.

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- Another topic which AB elaborated on was fees/pricing particularly in the US retail market. Peter Kraus commented that there is a very strong philosophical argument for the regulators to approve new fee structures which would allow investors to pay a low beta fee and a higher performance fee for alpha generated (while it exists in Europe, a similar structure is not available in the U.S.). While some in the industry may not be fans to adapt such a structure, given challenging cost structure changes, he thinks the product could be much more competitive relative to passive products.

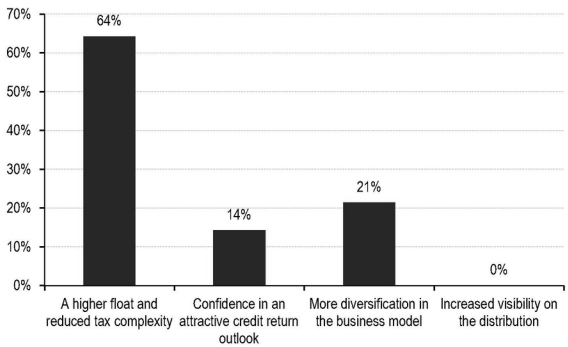
Alternative Asset Manager Top Takeaways

Ares Management (ARES), C-2-7, Neutral

- Michael Arougheti, Co-founder and President, presented for Ares. Overall, Mr. Arougheti was positive on the firm's growth prospects, given demand for their products across the platform by institutional investors. In addition, given recent fundraising and fees on the horizon, the outlook for FRE and DE is attractive.

- When asked "What would get you more interested in investing in ARES stock?" the most common response was a higher float and reduced tax complexity (64%), followed by more diversification in the business model (21%), and confidence in an attractive credit return outlook (14%). Investors were less concerned over the visibility on the distribution (0%).

Chart 60: What would get you more interested in investing in ARES stock?



Source: BofA Merrill Lynch Global Research

- If comprehensive tax reform includes an elimination of carried interest tax, potentially moving to an ordinary income rate, it could have some impact to after tax unitholder returns, but 80-90% of revenue comes from management fees and much of the income already faces a corporate tax rate. It could make it more attractive to shift to a C-corp. A change to the tax deductibility of interest expense could have more far-reaching changes to the business, and to U.S.

- Ares will always look to do tuck-in acquisitions, and has been doing almost one a year. The pipeline of M&A opportunities continues to grow for ARES, given demographics of principles with founders aging, and the environment becoming harder to compete for small managers.

The Blackstone Group (BX), C-2-8, Neutral

- Jonathan Gray, Global Head of Real Estate, presented for Blackstone. Overall, Mr. Gray was positive on the outlook for the U.S., with new pro-growth fiscal policies

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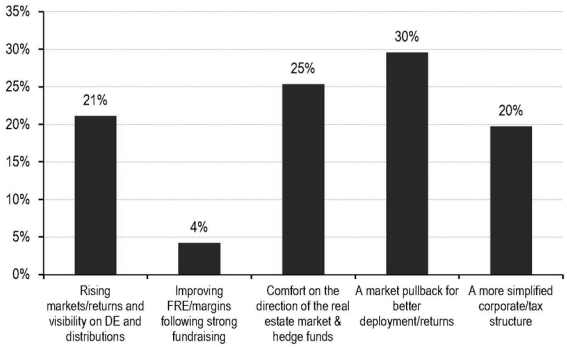
likely. Mr. Gray also thinks that concerns over the commercial real estate market may be overdone.

- When asked "What would get you more interested in investing in BX stock?" the most common response was a market pullback (30%), followed by comfort on the direction of the real estate market (25%), rising returns and visibility on distributions (21%), and a more simplified structure (20%), while fundraising and margin improvement were less important (4%).

Chart 61: What would get you more interested in investing in BX stock?



Source: BofA Merrill Lynch Global Research

- Mr. Gray thinks the economic narrative has changed for the U.S., from low growth and low interest rates to a more pro-growth outlook. There will likely be lower taxes, less regulation, and more fiscal spending. A potential offset is that deficits from government spending and tariffs could create inflation. Even so, management was cautiously optimistic on growth.

- For Europe, Brexit was the big news and Mr. Gray expects the next couple of years will be somewhat challenging for the U.K, though the bigger question is core Europe, where rates and inflation are likely to be lower for longer. In Asia, China is decelerating, particularly for manufacturing, infrastructure, and real estate which will likely continue though don't expect a hard landing in China. A trade war between the U.S. and China could be a risk to the downside for China. In India, BX sees accelerating economic growth and falling inflation and interest rates, along with a lot of demand for office space in India.

- Mr. Gray does not believe we are in the early stages of the real estate cycle, but concern over a bubble in commercial real estate in the U.S. is probably overdone for a couple of reasons. 1) Supply and demand are reasonable, given modest growth in supply and an economy that is growing. 2) Debt levels aren't out of hand like in '06/'07. 3) Cap rates are low at around 5%, compared to '07 when 10yr treasuries were at the same level. Overall, you aren't going to see the same returns as in the past, but looking at past periods where rates and growth increased, commercial real estate did fine.

- In terms of growth, Mr. Gray is optimistic on the outlook. Half of the areas BX invests in today didn't exist at the time of the IPO, and that culture of innovation, growth, and investing for attractive returns is alive and well.

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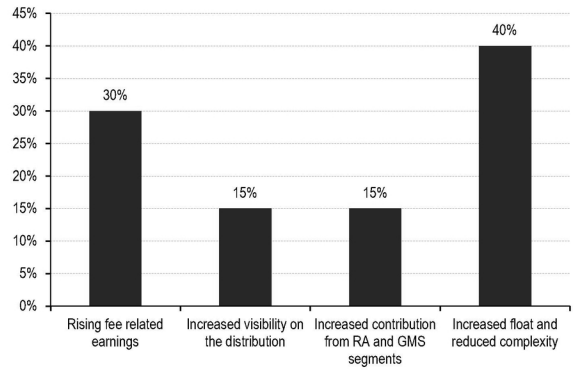
Carlyle Group (CG), C-2-8, Neutral

- Glenn Youngkin, President and Chief Operating Officer, presented for CG. Overall, Mr. Youngkin is positive on the economic/market backdrop and on CG's ability to generate cash carry relatively consistently over time given the firm's diversity of funds.

- When asked "What would get you more interested in investing in CG stock?" most investors would like to see an increased float and reduced complexity (40%), followed closely by rising fee related earnings (30%). Investors are also interested in seeing increased visibility on the distribution (15%) and increased contribution from RA and GMS segments (15%).

Chart 62: What would get you more interested in investing in CG stock?



Source: BofA Merrill Lynch Global Research

- If comprehensive tax reform includes an elimination of carried interest tax, potentially moving to an ordinary income rate, it could have some impact to after tax unitholder returns. However, Glenn thinks it is very early to speculate on any changes and expects tax changes to likely be comprehensive.

- Glenn sees the potential for a strong push in infrastructure, along with tax change, defense spending, and the border will get a lot of attention along with international trade. Three main conclusions: 1) First time in a long time that there is a universal pro-business outlook across congress and the presidential office; 2) Unclear today what is going to be enacted, there is optimism but uncertainty; and 3) CG is not going to make meaningful changes one way or another based on speculation. CG launched its latest infrastructure fund in September, and the election results are more wind in the sails.

- CG has multiple funds, each with its own economic engine. That makes the cash flow profile more stable than other firms. Management believes that a discounted valuation in the stock is driven more by fear of a recession vs. lower FRE. Glenn thinks that outlook has changed with the election. The economy may be going into extra innings now.

- The investment environment hasn't changed materially in last few weeks - it continues to be tough. Global growth will continue to be muted, and despite the

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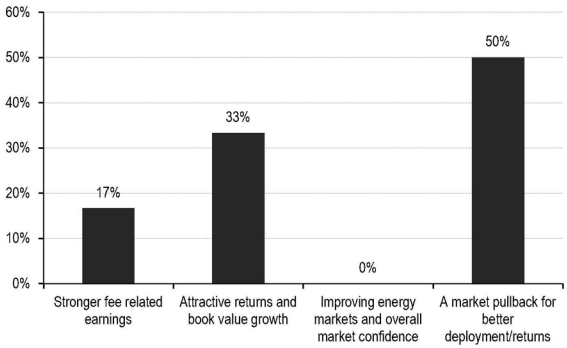
move in the ten year treasury rate, interest rates remain low and the combination of those things results in high prices.

KKR & Co (KKR), C-1-8, Buy

- Bill Janetschek, Chief Financial Officer, presented for KKR. Overall, Mr. Janetschek believes that KKR's balance sheet gives them the ability to take advantage of market dislocations, sees opportunities to grow in certain areas (e.g. infrastructure and real estate), and noted that they don't need to grow the headcount to bring on more assets.

- When asked "What would get you more interested in investing in KKR stock?" the most common response was a market pullback for better deployment/returns (50%). Respondents also felt that attractive returns and book value growth (33%), and stronger fee related earnings (17%) were also important. Less important for investors was improving energy markets and overall market confidence (0%).

Chart 63: What would get you more interested in investing in KKR stock?



Source: BofA Merrill Lynch Global Research

- Overall, KKR likes the publicly traded partnership structure today. If comprehensive tax reform includes an elimination of carried interest tax, the income would still get passed through in that scenario which avoids a second level of taxation, so it still may not be attractive to change the structure. But, if the corporate rate is also lowered significantly, it could potentially make sense to go to a c-corp.

- Bill sees infrastructure as a real growth area for KKR. 7-8 years ago it was difficult to raise an infrastructure fund as the asset class didn't do very well in the financial crisis; today there is more interest. KKR's first infrastructure fund was around $1B and the second one was around $3B. Infrastructure needs are tremendous long-term, with $1-2 trillion capital needed for projects over the next decade, and infrastructure spend is one area of consistency across the two major parties.

- Management thinks that investors understand the reason for the change in the distribution policy. KKR likes to pay out the stable dividend and redeploy capital into the balance sheet. As part of the year-end process, KKR will likely review the level of the fixed distribution and determine whether it should be changed. KKR would like to have around 40% of the balance sheet invested in private equity over time.

- KKR will manage concentration risk, and it is unlikely that the firm will make another investment as big as First Data again. The biggest advantage to having a

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large balance sheet is the ability to take advantage of market dislocation, along with high margins.

- The firm grew at a healthy rate from 2004-2014, and with around 1,200 people now there doesn't need to be much growth in headcount for the time being, the infrastructure is in place. Marshall Wace AUM has grown significantly since they did the deal, due in part to advantages from combining the two firms. Real estate is an area where KKR is small and could see more growth.

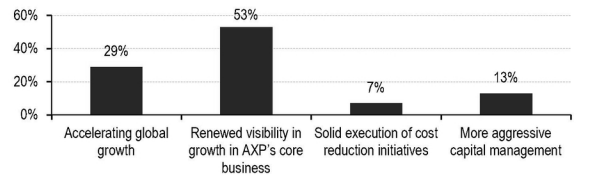
Specialty Finance

American Express Company (AXP), B-2-7, Neutral

- Presenting from American Express Company was Mr. Jeff Campbell, Chief Financial Officer. Overall we thought AXP presented a fairly upbeat outlook on billings, loan and revenue growth. AXP did express caution on near-term Discount rate pressures and FX headwinds.

- When asked what would be a key factor to increase / initiate a position in AXP, 53% of the audience said they would like to see better visibility in AXP's core growth. AXP acknowledged the sale of the Costco portfolio to Citi has added complexity to reporting results and has provided additional disclosures on underlying trends in the quarterly results. AXP also said that accelerating revenue growth is a key area of focus for management.

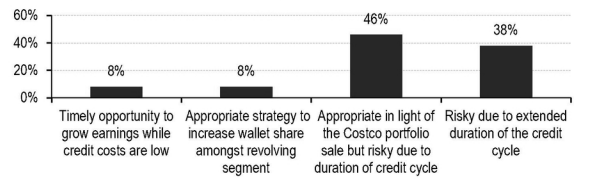
Chart 64: What would be a key factor for you to increase / initiate a position in American Express?



Source: BofA Merrill Lynch Global Research

- AXP was a little surprised that more investors did not view its focus on loan growth as an appropriate strategy to increase wallet share amongst the revolving segment. Instead a plurality of investors viewed AXP's strategy as appropriate in light of the portfolio sale but risky due to the duration of the credit cycle. While investors were concerned about the duration of the credit cycle, AXP emphasized its low loss rates and premium customer base as well as the loss of the Costco portfolio to argue that AXP's credit profile will not materially change from its current strategy to grow revolving balances through revolving credit card customers.

Chart 65: How would you describe American Express' strategy to expand exposure to credit?



Source: BofA Merrill Lynch Global Research

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- On a more cautious note, AXP said that Discount rate pressures are likely to remain elevated near-term as EU merchants renegotiate contracts post-interchange rules and the OptBlue program gains additional scale in the US. Strengthening in the US$ will also lead to FX headwinds that will likely impact NT results, particularly from countries like Mexico where AXP has a large business.

Conference Panels Top Takeaways

Contact your BofA sales representative for additional information.

Blockchain: Potential Transformation of Financial Markets

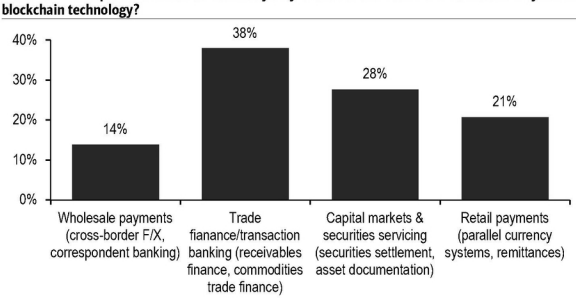
With Blockchain one of the most talked about potential disruption in financial services and 71% polled noting that blockchain is a significant opportunity for financial service firms, we thought it was timely to host a panel on the potential impact of Blockchain on financial markets that included **Co-founder & COO of R3 Todd McDonald and CEO of Axoni Greg Schvey.**

- **Blockchain could lead to $60-80bn of annual potential cost savings for financial institutions.** While it is still early days to know what the full impact of potential cost savings that blockchain technology could bring to financial institutions, the panelists believe that total savings could reach $60-80bn.

- **Successful implementation of equity swaps**. An area where Blockchain has shown to be successfully implemented is around equity swaps. Axoni had worked with multiple financial institutions to handle data reconciliation around its equity swaps record which drove efficiencies.

- **Trade finance viewed as most likely for success**. When asked which part of the financial industry will be the first to successfully utilize blockchain technology, 38% of those polled cited trade finance/transaction banking as the most likely, with 28% citing capital markets & securities servicing.

Chart 66: Which part of the financial industry do you believe will be the first to successfully utilize blockchain technology?



Source: BofA Merrill Lynch Global Research

- **Implementation could be earlier than expected.** While many investors are skeptical that blockchain will be broadly adopted in the near term, with none of the audience expecting it to be widely adopted within 12-24 months, the panelists were more optimistic and believes that there could be upside surprise in terms of the timing as proof points and implementation could happen more quickly than expected.

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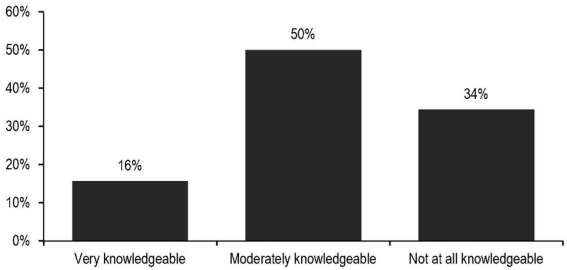
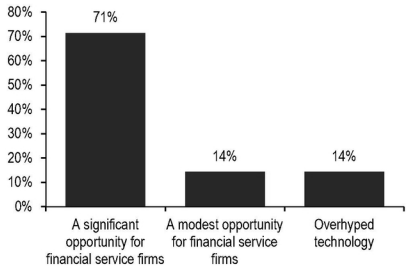
Chart 67: How knowledgeable are you with blockchain technology?



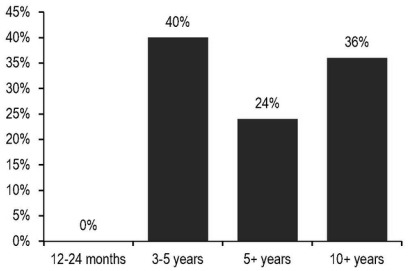
Source: BofA Merrill Lynch Global Research

Chart 68: After this panel, how do you feel about the applicability of blockchain technology in financial services?



Source: BofA Merrill Lynch Global Research

Chart 69: How long do you think it will take for financial sevices industries to broadly adapt blockchain technology?



Source: BofA Merrill Lynch Global Research

The Future of Clearing: Understanding the Options

- Guest speakers in this panel included Brian Ruane (CEO, Broker Dealer Services, BNY Mellon), Lee Betsill (Chief Risk Officer, CME Group), Michael C. Bodson (President & CEO, DTCC), John Horkan (Head of North America and Global COO, Rates & FX, LCH, LSE Group) and Marcus Denne (Director, Global Clearing, BofA Merrill Lynch).

- With the start of the Uncleared Margin Rule (UMR) on September 1st, we asked investors what was the primary challenge related to the new clearing rules. Most investors (95%) thought the rising cost, particularly in the amount of collateral required (50%) and the complexity around infrastructure and different country rules (45%) were the main issues.

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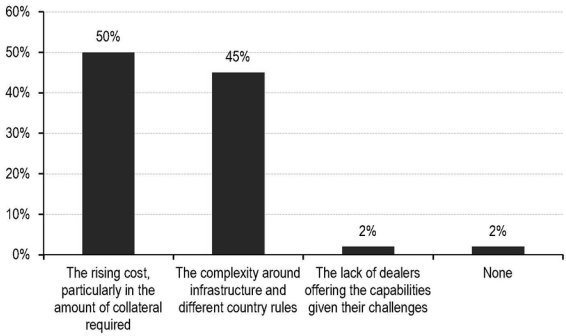
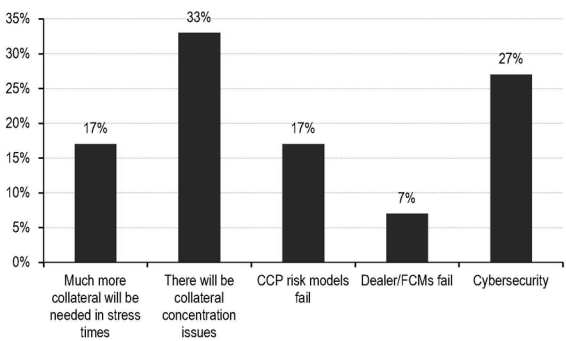
Chart 70: What is the primary challenge related to the new clearing rules?



Source: BofA Merrill Lynch Global Research

- Panel participants believe that the election/shift in regulatory outlook might lead to a slowdown of products being added to the clearing mandate, with FX being the biggest unknown.
- Going forward, firms are tackling U.S. vs Europe collateral harmonization/transfer (DTCC and Euroclear are working on a collateral transfer initiative that is expected to launch in 1Q17), collateral management through firms including BNY Mellon, and Cleared repo could also be on the horizon (CME has filed an application with the SEC but no timeline given).
- We asked investors what the biggest potential risks are in the clearing mandate and CCPs, and 33% of voting investors thought collateral concentration issues with cybersecurity (27%) coming in 2nd.

Chart 71: What is the biggest potential risk in the clearing mandate and CCPs?



Source: BofA Merrill Lynch Global Research

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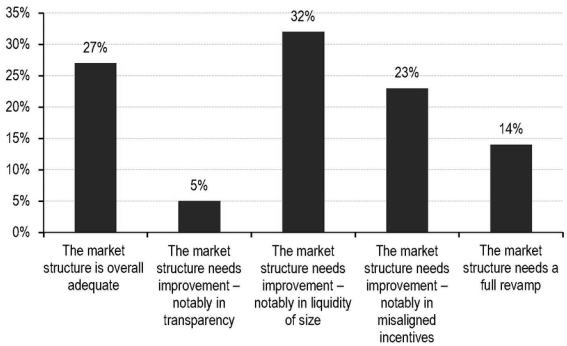
Equity Market Structure: Simplifying the Complex

- Guest speakers in this panel included Anthony Barchetto (EVP, Head of Corporate Development, BATS Global Markets, Inc.), Jamil Nazarali (Head of Execution Services, Citadel Securities Inc.), Eric Stockland (Chief Strategy Officer, IEX Corp.) and Pankil Patel (Managing Director, Electronic Sales, BofA Merrill Lynch).

- Panel members had a spirited debate regarding the current market structure pros and cons, rebates, off-exchange trading, latency, market maker obligations, and the future of regulation post the election.

- We asked investors what they thought of the current state of the equity market structure, and 74% thought that the market needs revamping. 32% believe that there was a problem with the depth of liquidity and 23% thought there were misaligned incentives.

Chart 72: What is your view of the current state of the equity market structure?



Source: BofA Merrill Lynch Global Research

- Given the announcement that SEC Chairwoman White will leave at the end of President Obama's term, this will likely lead to some regulatory uncertainty and lack of activity given not enough commissioners to make forward progress. In addition, the new Chair will likely be focused on less regulation and one panel member thought Reg NMS could come under review.

Life after DOL: Evolving Beyond the Fiduciary Rule

- We hosted industry experts for a panel on the Department of Labor's (DOL) fiduciary rule, which is set to go into effect in April 2017. Panel participants included Michael Hadley (Partner at Davis & Harman LLP), Lisa Bleier (Associate General Counsel at SIFMA), and Kevin Crain (Head of Workplace Financial Solutions at Bank of America Merrill Lynch).

- Given potential changes for the brokerage industry, we asked investors "Will the DOL's fiduciary rule cause meaningful changes to the brokerage industry?". Most investors believe that the rule will cause a number of significant changes to the brokerage industry (83%), including significant pressure on commission revenues, a shift to advisory and fee based accounts, and assets in motion with some to robo advisor and RIA platforms.

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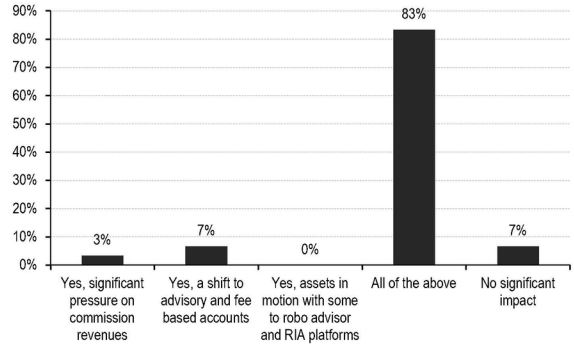
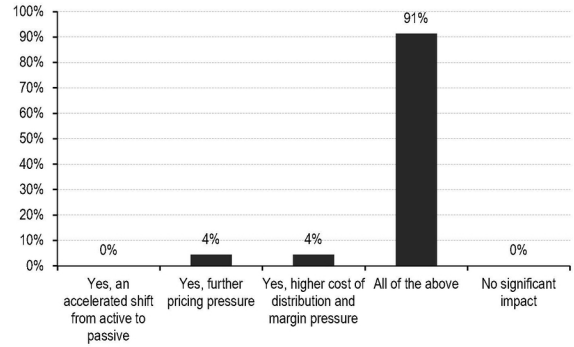
Chart 73: Will the DOL's fiduciary rule cause meaningful changes to the brokerage industry?



Source: BofA Merrill Lynch Global Research

- We also asked about changes to the asset management industry, positing "Will the DOL's fiduciary rule cause meaningful changes to the asset management industry?" Investors again expect multiple changes (91%), including an accelerated shift from active to passive, further pricing pressure, and higher cost of distribution and margin pressure. No respondents expect there to be no significant impact to the asset management industry.

Chart 74: Will the DOL's fiduciary rule cause meaningful changes to the asset management industry?



Source: BofA Merrill Lynch Global Research

- The panel noted that President Elect Trump did not address the Fiduciary Rule during his campaign, so his view on the rule is unknown, but Republicans have largely been against it. There is some precedence on what we could expect President Elect Trump to do with the fiduciary rule. President Bush had implemented an investment advice regulation that President Obama delayed several times until it was finally withdrawn. The view from the panel was that the most likely action over the next several months is that President Elect Trump delays the rule, though to repeal or change it would take work and new regulatory

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proposals. Mr. Trump and congress could also ultimately defer to the SEC to act on a Fiduciary Rule.

- The biggest issue from the brokerage industry is the contract requirement under the BIC. The issue with the contract is increased liability, given the contract makes it easier to litigate. This would likely be the primary area for modifications. Even though many firms have made announcements regarding changes they expect to make, most have not figured out all of the underlying steps yet given that it is so complicated and impacts large parts of the business.

- The industry will have to move forward on implementing the rule, given the April 2017 implementation date, but firms may not put as much effort into certain areas that need to be final by January 2018. In addition, prior to Mr. Trump starting, the transition team could make an announcement about the rule. However, even at that stage firms would have to determine whether or not to act on the announcement.

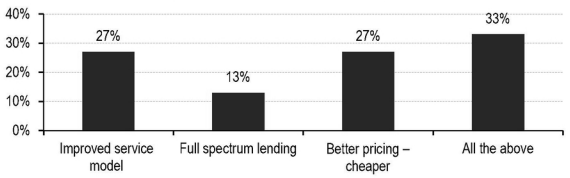
- While the most likely scenario is a delay in the rule, with the potential for some modifications to ease some of the burdens, most see the trend towards a fiduciary rule already well in motion for the industry.

The Future of Tech-Based Lending

- James Paris, Executive Vice President at Avant, Ashish Jain, Senior Vice President at SoFi and John Schleck, Senior Vice President at Bank of America discussed key trends and recent developments in Tech-Based lending.

- Audience members and panelists generally agreed that improved customer service, full spectrum lending, and better pricing all are contributing to the growth in tech-based lending. SoFi did caution that better pricing is not usually the primary driver as banks can usually offer cheaper pricing.

Chart 75: What is the biggest driver of growth in tech-based lending



Source: BofA Merrill Lynch Global Research

- Acquisition models differ by company but being efficient at customer acquisition is key for a successful tech-based lender. SoFi estimated that its customer acquisition cost is 1/5th that of a bank which enables it to effectively compete and partner with banks. Panelists highlighted the use of data analytics to more efficiently target potential customers via direct mail, digital ads or through affiliate programs.

- Audience members were split on the main risks to investing in tech-based companies with limited sustainable competitive advantage, untested credit models and fragile all highlighted as key risks. Somewhat surprising given events earlier this year, regulatory concerns were not high on the list of investor concerns.

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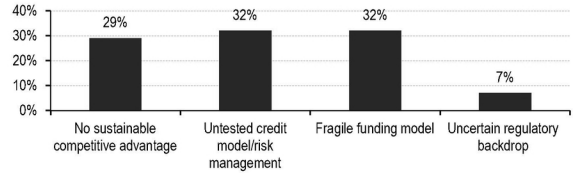
Chart 76: Biggest risks to investing in a tech-based lending companies



Source: BofA Merrill Lynch Global Research

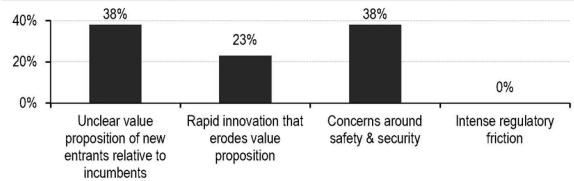
- Panelists agreed that flexible funding models that utilized both balance sheet lending and distribution of loans were important for a tech based lender. Additionally, panelists said that risk management is top of mind and tech based lenders are increasingly applying refined analytics that rely on credit variables directly from credit bureaus into their lending and portfolio management decisions

The Future of Payments: The Need for Speed

- Jonathan Lear, President – North America, Earthport and Bruce Parker, Founder of Modopayments spoke on The Future of Payments panel. In a wide ranging discussion, the panelists discussed the B2B opportunity, the importance of partnering with incumbents and the need to maintain Safety standards.

- Audience members identified the lack of a clear value proposition for new players relative to incumbents and concerns about Safety and Security as the largest risks to investing in new Fin Tech payments companies.

Chart 77: What is the primary risk to investing in new entrants within the payments landscape?



Source: BofA Merrill Lynch Global Research

- Panelists generally thought the best way for a new Fin Tech companies to succeed was by partnering with incumbents. This was consistent with the views of audience members, a majority of whom thought the payments industry would continue to be controlled by incumbent institutions partnering with innovative tech companies.

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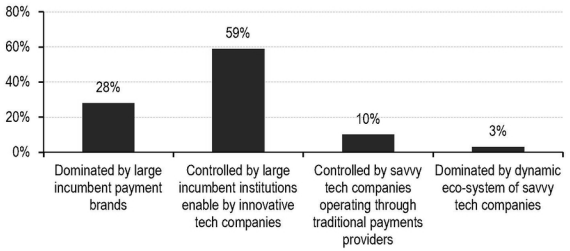
Chart 78: What do you believe will be the structure of the payments industry in 5-7 years?



Source: BofA Merrill Lynch Global Research

- Panelists highlighted that while recent innovations in faster payment transfers have been focused on P2P applications, the B2B opportunity is 7-10x larger. That said, panelists thought, based on experience in the UK, the cost of faster payments would likely have to be borne by the existing payment infrastructure as consumers have not been willing to pay for faster transfers. Additionally, panelists pointed out that in countries where faster payments have been implemented, it has mostly been a mandate by regulations suggesting the government has an important role to play.

- Panelists highlighted Security and Compliance as being essential for a new Fin Tech company to be admitted as part of the industry ecosystem. Incumbent payment companies will only partner with a new FinTech company that can meet the safety and regulatory standards that the incumbent is required to meet.

Robo Advisors: Shedding Light on the Potential Opportunity

- Guest speakers in this panel included Eli Broverman (Co-Founder and President of Betterment), Randy Sternke (Vice President, Business Development at Alkanza), and Vaughn Bowman (Director, Managed Solutions Channel Management at BofAML). Each firm discussed the unique aspects of their individual business models and where they see the robo industry headed in the future.

- Broverman brought up several key points on how the independent robo advisor model came about and why it will continue to grow in the future. He believes that the main drivers include a lack of quality advice for investors with few assets, investors' beliefs that financial institutions are not aligned with their interests or transparent, and the fact that people want financial services to work as well as the other technology in their lives. Broverman believes that the biggest opportunity going forward is in the mass affluent segment and the 401K space.

- Alkanza is focused on providing robo capabilities to financial advisory firms through partnerships, rather than directly to consumers, with a focus on the platform as well as portfolio construction.

- We surveyed the audience to gauge their views on the potential size of the robo advisor market and the most common answer was that assets will surpass $1T, followed by assets will hit $500B and then level out.

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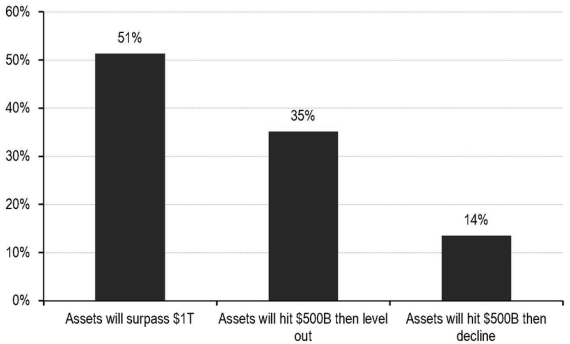
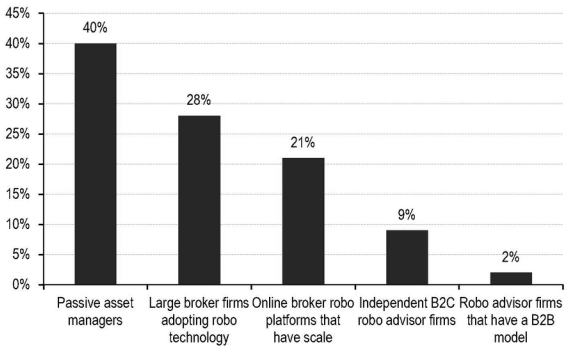
Chart 79: How significant do you think robo advisor platforms will become over the next 3-5 years?



Source: BofA Merrill Lynch Global Research

- Based on our polling questions, investors believe that the main beneficiaries of the robo advisor trend will be the passive asset managers (40%), followed by the large broker firms adding robo technology (28%) and the online brokers that have scalable robo platforms (21%). They also believe that the main driver of success for robo advisors will be a low and transparent cost structure (44%), followed by an efficient technology and user interface (25%).

Chart 80: Which firms will benefit the most from the robo advisor trend?



Source: BofA Merrill Lynch Global Research

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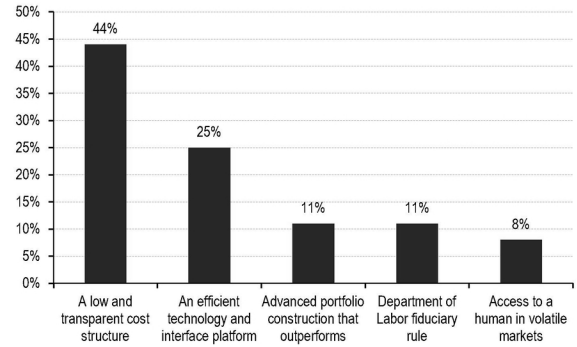
Chart 81: What do you expect to be the main driver of success for robo advisors?



Source: BofA Merrill Lynch Global Research

- Finally, all of the panel participants believe that the DOL Fiduciary Rule will not be repealed by the new administration, although it may be delayed. In the end, this should benefit robo advisors, as most of the models have low fee structures and limited conflicts of interest.

State of the Multifamily Market: Cooling or Collapsing?

We hosted a panel to discuss the state and the outlook for the multifamily market following a year which has witnessed increased investor anxiety around multifamily loan growth and heightened scrutiny by banking regulators of multifamily loan portfolios, particularly at banks with a high concentration of multifamily loans. Our panelists included **John Jardine, Co-CEO of Ares Commercial Real Estate Corp, David Brickman, Executive Vice President and the Head of Multifamily business at Freddie Mac** and **Alan Fishman, Chairman of the Board at commercial real estate investment trust Ladder Capital.**

- **Multifamily on solid footing:** The panelists view the multifamily market as having a solid foundation with most of the risk lying at the high end, class A properties in particular markets (New York, San Francisco). Even here, the panelists agreed that the issues at the high end segment were more likely to manifest themselves in the form of decelerating growth in rents (and increased incentives by landlords) as opposed to serious credit issues. Investors echoed this sentiment during a live audience poll with 60% of the investors seeing issues in the multifamily market limited to certain regions and at certain rental price points.

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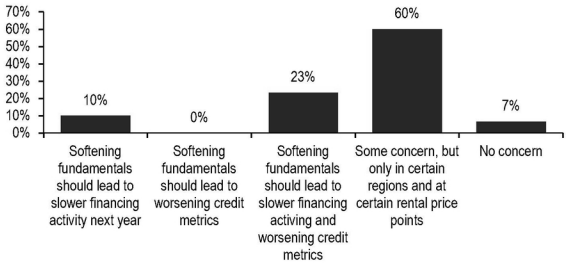
Chart 82: How do you view fundamentals for multifamily lending in 2017?



Source: BofA Merrill Lynch Global Research

- **Future demand in multifamily promising:** Looking forward, the panelists see healthy demand for multifamily housing given a preference among millennials to live in urban areas versus the suburbs. Moreover, the panelists noted that increasing debt burden tied to student loans is likely to make home ownership out of reach for several first time home buyers. Furthermore, it was noted that the US needs 1.5mn new housing units each year and the present level of construction activity was not keeping pace with this when looking at it on a national level.

- **Foreign capital part of the equation:** Some of the panelists are seeing a significant flow of foreign capital into the multifamily market with Mr. Brickman surmising that data around inflow of foreign capital into the commercial real estate market was likely understated given that significant amount of inflows have come indirectly through investment vehicles like private equity.

- **Risk retention rules modest impact**: Our multifamily panelists viewed the risk retention rule for CMBS as having a modest impact given the large role played by the GSEs in lending to the multifamily space. It was also noted that while the rule may dampen private securitization activity, less competition from the CMBS markets would be a positive for balance sheet lenders.

- **Impact from rising rates may not be all news**: While the panel acknowledged that the rise in interest rates will likely push cap rates higher, an increase driven by a more favorable growth outlook may not be as bad. This is because a stronger economy should theoretically lead to a better backdrop for jobs and wage growth, thereby providing landlords some leeway to raise rents.

The Future of Big Data in Financials

We hosted a panel to discuss how big data is impacting the financial services industry. The panel discussed key big data buzzwords including machine learning, data scientist, structured data and unstructured data. They panel also reviewed how different firms are adapting big data solutions to solve specific company issues. Our panelists included **Jessica Donohue, the Chief Innovation Officer for State Street and the head of advisory and information solutions for State Street Global Exchange, Greg Michaelson, head of data science practice at Data Robot, and Sandeep Saini, head**

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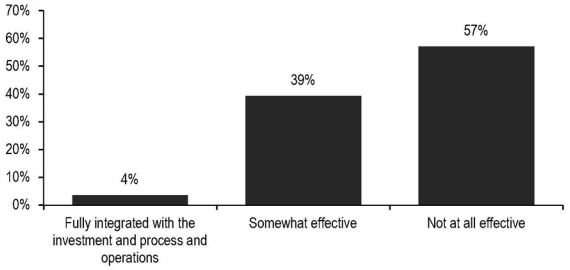
of global markets sales, research, and capital markets technology at Bank of America Merrill Lynch.

- **How big data can influence the future**: The panel confirmed the notion that there are many different definitions for big data, but everyone seemed to agree almost all financial firms are seeking effective ways to implement big data techniques to 1) generate alpha, 2) manage risk 3) manage expenses.
- **Companies polled are a long way from benefitting big data**: 96% of the audience polled said their firm is either somewhat effective or not at all effective at using big data. Some of the main challenges the panelists highlighted during our discussion were merging multiple legacy data systems and finding attractive talent with both data science and business experience.

Chart 83: How effective is your firm at using big data?



Source: BofA Merrill Lynch Global Research

- **The panel discussed three roles needed to solve data science problems**: 1) someone who has sway to make change and implement solutions 2) business champion, someone to discuss solutions with technical employees and to share knowledge on key issues such as regulation 3) technically savvy employees.
- **Implementation advice:** The panel provided advice for firms that have yet to utilize big data to attempt to solve problems facing their companies. The advice included seeking problems that could be solved using data science and focusing on small wins with the data present.

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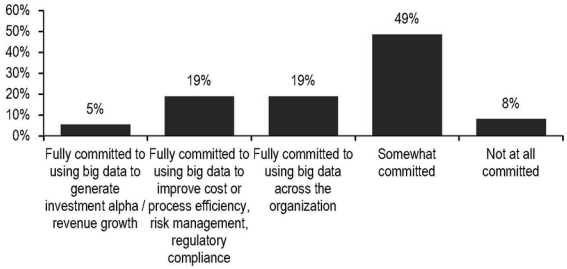
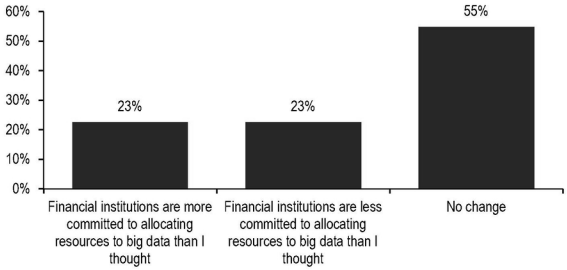
Chart 84: Now that we've defined "big data", how far do you think financial institutions are at embracing the use of big data today?



Source: BofA Merrill Lynch Global Research

Chart 85: After this conversation, have you changed your mind on how financial institutions are adopting big data in their businesses?



Source: BofA Merrill Lynch Global Research

The Future of Financials M&A and Regulation

We hosted a panel to discuss the state and outlook of M&A and regulation. Given the results of the US election and the potential for easing of regulations, the panel discussed a timely topic on the mind of investors. Our panelists included **Rodgin Cohen, Senior Chairman of Sullivan & Cromwell; Richard Kim, partner at Wachtell, Lipton, Rosen & Katz**, and **Ed Hill, Senior Vice President, Government Affairs, Bank of America Corporation.**

- **Regulation is about tone**: Our panelists agreed that the scope and strength of regulation comes from the tone and attitude of regulators rather than from legislation. They noted that an attempt to repeal legislation such as Dodd-Frank would be misplaced as most direction derives from the tops of regulatory bodies. They also felt Senator Hensarling's Financial Choice Act would not be a better alternative to Dodd-Frank given the 10% leverage ratio is not a Federal Reserve definition of leverage. Utilizing a Fed definition would likely lead to leverage north of 10%. The inclusion of CAMEL ratings with the leverage ratio would also allow regulatory sway over institutions.

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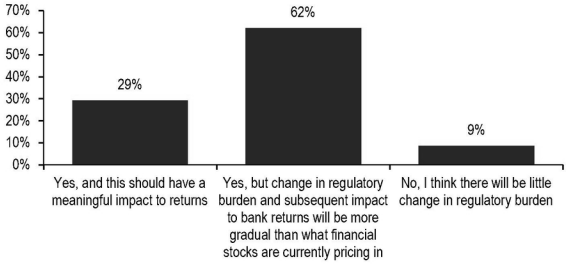
Chart 86: Following last week's GOP sweep, do you think regulatory relief is in the cards for the financial services industry?



Source: BofA Merrill Lynch Global Research

- **CCAR a product of regulatory attitude:** The panelists agreed that CCAR in its current form is not a result of legislation as post-recession bank stress tests (SCAP) existed prior to Dodd-Frank. Furthermore, the panelists noted Dodd-Frank's definition of a stress test is very basic, which has been made more stringent and complex as a result of regulators. Mr Cohen also noted that a lack of transparency of the test was the least defensible part of CCAR.

- **Biggest obstacle for bank M&A and activist influence is regulation.** Despite headlines of increased shareholder activism within the banking industry, the majority of investors polled (61%) believe activist investors have only a moderate impact on corporate strategy (see chart). Specifically, Mr. Cohen explained that two of the three reasons why an activist will typically get involved with a corporate are difficult to achieve on a bank's board given the level of regulatory oversight on the industry. While selling the bank is the one area where activists have had success, this typically occurs at the community bank level. That said, he believes a change in attitude of regulators could free up M&A activity.

Chart 87: What kind of impact does an activist investor have in corporate strategy and ultimate shareholder value?

Source: BofA Merrill Lynch Global Research

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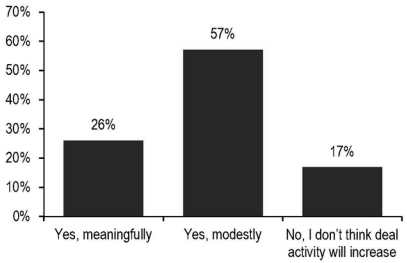
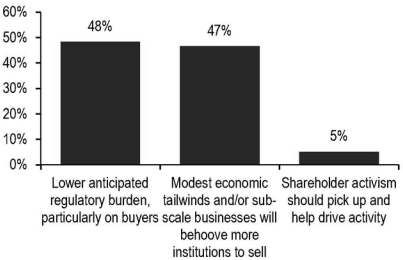
- **How to do M&A right**: When describing acquisitions that most impressed the panelists, a key reason for success was the acquirer keeping the target management in place as well as giving the target management independence. The scope and planning of the integration was also critical for success.

Chart 88: Do you think M&A activity in financial services will pick up in 2017?



Source: BofA Merrill Lynch Global Research

Chart 89: If you voted yes, what statement closely matches your rationale?



Source: BofA Merrill Lynch Global Research

Understanding the Changing Fixed Income Markets

We hosted a panel to discuss the evolution of the fixed income market structure given the advent of electronic trading and regulatory construct. Our panelists included **Lee Olesky (co-founder and CEO of Tradeweb), Adam Brown (Head of US Rates Electronic Trading at BofAML)** and **Brian Callahan (Head of US Par Loan Trading and the head of Electronic Initiatives for Global Credit and Special Situations at BofAML).**

- **Electronification of fixed income markets steadily growing; however, lag European market**. Electronic trading came to fixed income trading in the late 1990's as a way of automating transactions (i.e. create a more efficient process between parties). Today in the US, the investment grade market is 16-20% electronic, the high yield market is 8% (has doubled over the last few of years), the treasury market (which has been growing steadily over last 10-15yrs) is 80-90% of the actual trade count is electronic. While the electronification of the derivative market was slower to evolve, recent regulatory reform has accelerated the electronification process (50% today). That said, while the evolution towards electronification in the US continues to grow, the European bond market is actually more advanced with nearly 50% of the bond market automated (vs. 20% for the US).
- **Regardless of possible regulatory relief, electronification may slow but won't end entirely**. While a partial repeal or lightening of Dodd-Frank would be a net positive for the financial markets, and possibly lower the costs to banks and end-users, Mr. Brown doesn't see a dramatic effect on the market structure. In other words, regulatory relief may only slow down the electronification progress.
- **Electronification within the fixed income market is a modest priority among asset managers**. Fifty-two percent (52%) of the audience polled believe it to be a modest priority in their own corporate strategy to embrace new technologies/electronification in fixed income. Mr. Brown was not surprised by the results as many of the asset managers have their own constraints from technology funding to regulatory issues to running the day-to-day business. While

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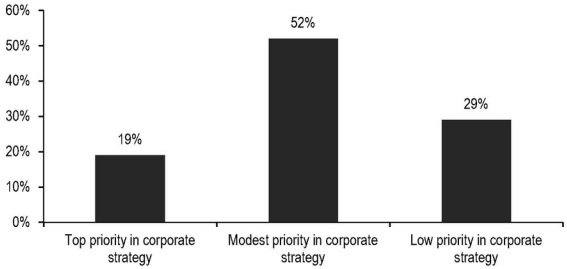
electronification is something that pays dividends, these benefits occur over time. That said, general sentiment from asset managers is that electronification is something they want as it leads to efficiency.

Chart 90: As you think about corporate strategy for asset managers, how open is your firm with embracing new technologies/electronification in the fixed income space?



Source: BofA Merrill Lynch Global Research

- **ETF market for fixed income securities expected to grow significantly**. Unlike in the equities market where ETFs are 7% of the volume traded, fixed income ETFs are still sub-1% (0.8% at YE15). As the market continues to grow, particularly in the asset classes where the underlying bonds aren't that liquid, Mr. Callahan noted seeing increased liquidity in the ETFs for liquidity reasons. Following in the footsteps of the equities market, Mr. Callahan expects the fixed income ETF market to grow significantly and be very impactful to the overall market structure.
- **Greater concern around speed at which liquidity can change vs. liquidity in the market**. There is a lot of concern around liquidity in fixed income markets. That said, Mr. Brown is more concerned with the speed at which liquidity can change. There has been growing evidence that the market is going to adjust greater and faster than the underlying fundamental reasons for the correction. As such, this is causing participants to revisit how they look at risk management. Now market participants need to take into account not only their behavior, but their reaction to other participants' behavior (i.e. contagion effect).
- **Fewer, well-established platforms reduce overall risk within system**. Eighty-nine (89%) percent of the audience polled prefer to conduct business with a few, well-established platforms to diminish risk within the system. Using the government bond market as an example, Mr. Olesky points out that the growing contribution from PTFs to the overall treasury trade volume has increased the risk outside the primary-dealer system. This is a risk Mr. Olesky believes needs to be addressed and prefers a central clearinghouse for fixed income transactions.

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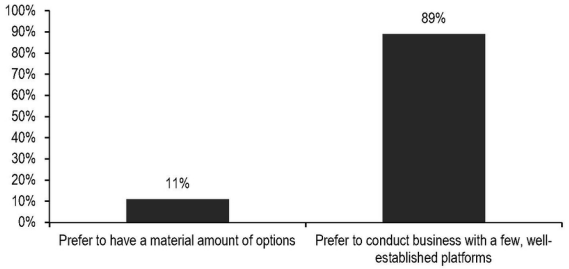
Chart 91: As you think about platform management, what is your view on having multiple options of liquidity providers?



Source: BofA Merrill Lynch Global Research

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Table 1: PO Changes

Firm	Rating	QRQ	Current Price	Old PO	New PO
ASB	UNDERPERFORM	B-3-7	$22.45	$19.00	$20.00
BANC	NEUTRAL	C-2-7	$14.80	$18.50	$15.50
BBT	BUY	B-1-7	$42.82	$41.00	$45.00
BKU	BUY	C-1-7	$34.19	$36.00	$37.00
BOH	UNDERPERFORM	B-3-7	$85.67	$64.00	$75.00
C	BUY	B-1-7	54.63	$55.00	$60.00
CBF	BUY	C-1-7	$35.80	$35.00	$38.00
CBSH	NEUTRAL	A-2-7	$56.39	$53.00	$60.00
CFG	BUY	B-1-7	$30.73	$28.00	$33.00
CFR	UNDERPERFORM	B-3-7	$82.93	$70.00	$74.00
CMA	UNDERPERFORM	B-3-7	$59.21	$49.00	$55.00
EWBC	BUY	B-1-7	$45.64	$45.00	$50.00
FBP	NEUTRAL	C-2-9	$6.29	$6.00	$6.50
FCB	BUY	C-1-9	$39.75	$44.00	$44.00
FHB	NEUTRAL	C-2-7	$29.48	$28.00	$31.00
FHN	UNDERPERFORM	B-3-7	$17.97	$14.50	$16.00
FITB	NEUTRAL	B-2-7	$24.90	$23.00	$26.00
FSB	NEUTRAL	C-2-9	$33.80	$40.00	$36.00
GS	BUY	B-1-7	$206.26	$195.00	$230.00
GWB	BUY	B-1-7	$38.85	$38.00	$42.00
HBAN	BUY	C-1-7	$11.93	$12.00	$13.00
HBHC	NEUTRAL	B-2-7	$39.05	$35.00	$41.00
IBKC	BUY	B-1-7	$78.05	$74.00	$85.00
JPM	BUY	B-1-7	77.40	$74.00	$83.00
KEY	BUY	B-1-7	$16.73	$17.00	$18.00
MS	BUY	B-1-7	$39.19	$36.00	$43.00
NYCB	BUY	C-1-8	$15.36	$17.00	$17.00
PB	UNDERPERFORM	B-3-7	$64.38	$50.00	$58.00
PNC	BUY	B-1-7	$107.51	$100.00	$110.00
RF	NEUTRAL	B-2-7	$12.89	$11.00	$13.00
SBNY	BUY	B-1-9	$147.02	$140.00	$160.00
SIVB	BUY	B-1-9	$147.35	$140.00	$165.00
SNV	NEUTRAL	C-2-7	$38.01	$35.00	$40.00
STI	BUY	B-1-7	$50.79	$48.00	$53.00
TCB	UNDERPERFORM	B-3-7	$16.23	$13.50	$14.00
TCBI	NEUTRAL	C-2-9	$70.75	$62.00	$74.00
UMBF	BUY	B-1-7	$72.04	$65.00	$78.00
USB	NEUTRAL	B-2-7	$47.87	$45.00	$50.00
WFC	BUY	B-1-7	51.68	$50.00	$55.00
ZION	UNDERPERFORM	C-3-7	$37.46	$30.00	$36.00

Source: BofA Merrill Lynch Global Research

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Price objective basis & risk

AllianceBernstein (AB)
Our $25 price objective is based on 13x target P/E on our '17E, a discount vs our target for asset managers as a group, based on improving but inconsistent flows and limited active equity exposure as well as the MLP structure which means less liquidity, though a high distribution. Upside/downside risks to our price objective are market appreciation/depreciation, similar to other asset managers, underperformance, and an unpredictable yield since it is based on earnings rather than fixed. Because Alliance is an MLP, total potential return includes a variable distribution based on earnings.

Amer Express (AXP)
Our $74 price objective reflects a 13x PE multiple to our 2017 EPS estimate. Given the elevated uncertainty, we expect AXP will trade near the low end of its historical valuation range, which averages 12x-16x. This multiple reflects our view of solid loan growth and better billings, offset by increased risks of rising credit and marketing costs. We think the market will view AXP through a more credit card lens in the near-term, which also supports a multiple at the low end of the historical range.

Upside risks to our PO are stronger than expected macroeconomic conditions, accelerating consumer and business spending, lack of disruptions in capital markets, or a decreasing regulatory burden. Downside potential could come from weaker than expected macroeconomic conditions and renewed recessionary pressure, softer consumer and business spending, disruptions in capital markets, or an increasing regulatory burden.

Ares Management (ARES)
Our price objective (PO) for Ares is $18, which implies a target price-to-ENI (P/ENI or P/E) multiple of 11x our 2017 ENI estimate. Our price objective is based on our sum-of-the-parts (SOTP) analysis. Our SOTP analysis includes the following components: a target multiple on fee related earnings (15x - in line with or a premium to asset manager multiples given healthy growth and sticky assets), book value for the balance sheet investments and accrued carry, and a discounted value on the performance fee upside over a cycle (1.3x MOIC). Based on this method, we value the fee related earnings at $13/unit, the balance sheet (principal investments and accrued carry) at $4/unit, and the discounted value of future carry income and investment income at $1/unit, which equates to a total value of $18.

Risks to our PO: a weak macro and capital markets backdrop, potential changes in tax laws related to carried interest and partnerships, legal and political risk, increased regulation, credit market disruptions, poor performance, weak fundraising, expansion risk, key person and talent risk, competition, a unique corporate structure that limits unitholder control, and lock ups.

Associated Banc-Corp (ASB)
We use an equal weighted three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $20 price objective and assign a 1.4x multiple to 3Q17E TBV and a 14.9x 2017 P/E multiple, in-line with smid-cap peers due to their near median return profile. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 5%. The upside risk to our price objective is a less onerous residential RE cycle. Downside risks are a double dip in housing prices, deteriorating energy portfolio and falling rental income for commercial properties.

Banc of California (BANC)
To arrive at our $15.50 price objective, we have employed a three-factor valuation methodology that incorporates target P/E, target P/TBV and a DCF model. For our P/E analysis, we use a 14x earnings multiple on BANC's 2017E core earnings below peer

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multiples due to lagging EPS growth. For our P/TBV valuation, we apply a 1.2x tangible book multiple to BANCs 2Q17E tangible book below peer multiples due to lagging ROTE. For our DCF analysis, we forecast net income growth stabilizes at 3% in the terminal stage. We also assume a beta of 1.1x in the terminal stage.

Downside risks to our price objective are slower than expected loan growth, and a reduction in the common dividend.

Bank of Hawaii Corp. (BOH)
We use an equal weighted three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $75 PO and assign a 2.2x multiple to 2Q17E TBV, representing a premium to peers, which we believe is appropriate given a stronger profitability and capital profile. Our 17x multiple on 2017E EPS is equal to the the peer median given average EPS growth relative to peers. Our DCF assumes a two-stage cost of capital of 9.8% and a terminal growth rate of 3%.

Downside risks to our price objective are a longer-than-anticipated low rate environment and a reversal of local economic improvement. Upside risks are a stronger-than-expected economic rebound, better-than-expected capital distribution and a shorter-than-anticipated low rate environment.

BankUnited, Inc. (BKU)
To arrive at our $37 price objective, we have employed an equal-weighted three factor valuation methodology that incorporates target P/TBV, P/E and DCF. We have applied a target P/TBV value multiple of 1.5x on our 2Q17E TBV and a P/E target multiple of 16x '17 EPS, based on BKU's above average growth relative to peers. Our DCF assumes a two-stage cost of capital of 7.9% and 9.3% and a terminal growth rate of 6%.

Downside risks to our price objective are slower CRE loan growth on the back of regulatory oversight, as well as an inability to deploy excess capital, increased competition for Florida M&A and an inability to continue to implement an organic growth strategy in New York City.

BB&T Corporation (BBT)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $45 PO and assign a 1.6x multiple to 2017E TBV and 14.5x multiple on 2017E EPS. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%.

Our EPS multiple is in-line with BBT's historical avg, which reflects very high-growth years in the 1990s, a pace unlikely to be achieved near term given BBT's size as well as the challenging macro backdrop and industry headwinds. Our DCF assumes a two-stage cost of capital of 9.7% and 10.9% and a terminal growth rate of 4%.

Risks to our price objective are macro risks such as a double dip recession, the implementation of a strict liquidity coverage ratio and further regulation on overdraft income that restricts bank profitability. Specific to BBT, risks are enhanced regulatory scrutiny and capital standards as a Domestic SIFI, the announcement of a large, expensive deal, and the risk that the NPBC transaction does not consummate.

Capital Bank Financial Corp. (CBF)
Our $38 PO is based on an equal-weighted, two-factor valuation methodology that assumes: We assumes a 20.0x P/ 2017e EPS and a target P/TBV of 1.6x to 2017E tangible book given our forecast above peer EPS growth.

Downside risks to our PO are an inability to deploy excess capital and create value through acquisitions.

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Citigroup Inc. (C)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $60 PO, assigning a 0.9x multiple to 2017E TBV and 11x multiple on '17E blended NA and EM earnings. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%.

Near term, we view C's current market multiple as overly discounted, but expect money center banks will likely continue to trade at a discount to the regionals. Our 1x TBV multiple represents a 0.3x discount to our median multiple for our universe. Our discount to TBV is a reflection of the earnings drag from Holdings and the fact that money centers will most likely continue to trade at a discount to regional peers. Our 11x 16E multiple is based on a sum of the parts analysis, where we apply a 10.5x multiple, on all operations ex. Lat Am and Asia GCB. We then apply a 11x multiple on Lat Am and Asia GCB to represent the earnings growth for consumer banking in emerging markets. Lastly, we deduct the earnings drag from Holdings. Our DCF analysis assumes a 5% growth rate and two stage cost of equity of 13%.

Risks to our PO are macro risks such as a slower than expected rate of fed hikes, and economic downturn and further scrutiny of the financials industry. Specific to C, risks are enhanced regulatory and capital standards as a Global SIFI, slower wind-down on Citi Holdings than expected, and slower-than-expected growth in the emerging markets and potential fines.

Citizens Financial Group (CFG)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $33 price objective and assign a 1.2x multiple to our 2017E TBV in-line with other asset sensitive peers. We place a 15x multiple on our 2017E EPS, also in-line with its asset sensitive peer group. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 5%.

Downside risks to our price objective are: 1) a significantly delayed Fed rate hike leading to pressured revenue growth, 2) higher losses associated with CFG's consumer oriented loan portfolio, and 3) a quicker than expected credit normalization.

Comerica Incorporated (CMA)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $55 PO, and assign a 1.2x multiple to 2017E TBV (in line with the median energy-exposed peers) and 16x multiple on 2017E EPS due to below peer EPS growth and ROTE. We have weighted the P/E and P/TBV factors equally at 33%, and our DCF analysis by 33%. Our DCF assumes a two-stage cost of capital of 12.3% and 10.5% and a terminal growth rate of 5% and Tier 1 common of 8% at termination.

Downside risks to our PO are a more severe than expected impact from lower energy prices, or a slower than expected rate of fed hikes. Upside risks are a better than expected rebound in energy prices and sooner recognition of cost saves.

Commerce Bancshares Inc. (CBSH)
We use an equal-weighted three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $60 PO and assign a 2.2x multiple to 2Q17E TBV, representing a premium to peers, given higher-quality earnings and capital position. Our assigned 18x multiple on 2017E EPS is at a premium to peers due to higher earnings quality. Our DCF assumes a terminal cost of equity of 9%, and a terminal growth rate of 3%.

Downside risks to our price objective are regulatory headwinds, or longer-than-anticipated low-rate environment. Upside risks are a stronger-than-expected economic rebound, better-than-expected capital distribution and a potential takeout above our price objective.

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Cullen/Frost Bankers Inc (CFR)
To arrive at our $74 price objective, we employed a three-factor valuation methodology that incorporates target P/E, target P/TBV and a DCF model. For our P/E valuation, we apply a 15x earnings multiple on CFR's 2017E core earnings. For our P/TBV valuation, we apply a 1.7x tangible book multiple to CFR's 2017E tangible book. Both multiples are lower than peers for CFR due to EPS headwinds and rising credit costs from lower energy prices. For our DCF analysis, we use a net income growth of 3.0% and assume a beta of 1.0 in the terminal stage.

Upside risks to our PO: a sharp rebound in oil prices, higher than expected interest rates, stronger loan growth, better than expected credit performance of CFR's energy loan portfolio. Downside risks: A worse than expected decline in Texas economic growth that impacts CFR's balance sheet growth, a slower than expected pace or rate hikes and a worse than expected sell off in oil prices.

East West Bancorp, Incorporated (EWBC)
Our three-pronged valuation methodology (target P/E, target P/TBV, and DCF analysis) drives our price objective of $50. We assumes a 16.0x P/ 2017e EPS and a target P/TBV of 2.0x to 2Q17E tangible book given our forecast above peer EPS growth. Our DCF assumes a two-stage cost of capital of 9.5% and a terminal growth rate of 3% Upside risks to our PO are a quick economic recovery (led by stabilization or appreciation in CA housing values) or a faster than expected recovery in China. Downside risk to our PO is an even deeper economic slowdown driving corporate losses higher than we currently anticipate, faster than expected normalization in credit.

Eaton Vance (EV)
Our $35 price objective is based on a target P/E of 15x calendar 2016E (14x '17E), at a discount to our asset-manager group target multiple, given recent outflows from high fee products, offset by distinct products in areas such as floating rate and overlay.

Downside risks to our price objective are market depreciation and investment under-performance, as for all asset managers, and (should the economy slow) concentration in some credit areas, such as bank loan funds, high yield and longer-duration munis. Upside risks are improving performance, flows, or future traction from EV's ETF licensing initiative.

FCB Financial Holdings, Inc (FCB)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $44 price objective and assign a 1.6x multiple to our 2017E TBV given that we believe the market would pay a 0.3x premium for FCB's 2016 estimated returns in line with the median premium of its peer group (Florida banks, High Growth, Bank Acquisition, and SMIDs). We place a 18x multiple on our 2017E EPS, a premium to its SMIDs peers given our outlook for stronger EPS growth. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 3%.
Downside risks to our price objective are a deterioration in credit quality in FCB's unseasoned newly originated loan portfolio, a downturn in the Florida economy, and continued competition for C&I loans. Upside risks are a better than expected improvement in its return profile and a much stronger economic improvement in the Florida economy.

Fifth Third Bank (FITB)
Our PO of $26 is predicated on target P/E multiple of 15x to reflect higher confidence in FITB achieving most of its profit improvement goals related to Project North Star. This represents a modest premium versus peers. Downside risks to our PO are a prolonged low interest rate environment, expensive M&A and slower than guided loan growth on weaker economic activity.

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First Bancorp Puerto Rico (FBP)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $6.50 price objective. We assign a 1.0x multiple to our 2Q17E TBV, below the 1.6X for peers, due to the overhang of PR fiscal issues that may reduce TBV. Our revised implied 2Q17E TBV of 1.0x is consistent with a 5% ROE. We assign a 10x multiple to our 2017E EPS, in line with peers. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 3%.

Downside risks to our price objective are a worse-than-expected restructuring of PR government debt, deterioration in the Puerto Rican economy that could hurt the ongoing credit and earnings recovery at FBP, a change in management's strategy to dispose troubled assets, and potential regulatory risk stemming from the ongoing implementation of the Dodd-Frank financial rules. Upside risks to our price objective are a much stronger economic improvement in Puerto Rico and a better-than-expected improvement in asset quality trends at FBP.

First Hawaiian Inc. (FHB)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $31 PO and assign a 2.2x multiple to 2017E TBV and 17x multiple on 2017E EPS, representing premium target multiples for the median smid-cap banks under coverage. We have weighted the P/E and P/TBV factors equally.

A superior profitability profile suggests an above peer multiple. Our DCF assumes a two-stage cost of capital of 8% and a terminal growth rate of 4%.

Risks include 1) FHB's reliance on the Hawaiian economy with 80% of the franchise spread across Hawaii, Guam, and Saipan poses downside risk to EPS from a severe economic downturn in this region. 2) While FHB has a history of conservative underwriting its exposure to auto loans could serve as an overhang if investor concerns around the health of the auto sector and consumer increase. 3) Expectations for continued divestiture by French bank BNP (owns 82% of shares o/s) could temper stock performance.

First Horizon National Corp. (FHN)
We use a three-prong valuation framework (P/E, P/TBV, DCF) to arrive at our $16 price objective and assign a 1.5x multiple to 2Q17E TBV and a 14x multiple to 2017E EPS (inline with median for our mid-to-small cap universe). We believe that this valuation discount is warranted given the below average earnings growth that we forecast for FHN. Our P/TBV and P/E targets reflect our expectation that earnings growth and profitability will remain challenged by a low growth low interest rate environment. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 5%.

Downside risks to our price objective are a double dip in home prices and slower residential real estate recovery. Upside risks are FHN being taken out above our price objective and better performance in the economy than we expect.

Franklin Financial Network, Inc. (FSB)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $36 price objective and assign a 1.8x multiple to our 2Q17E TBV, given that we believe the market would pay no premium for FSB's 2016 estimated returns of 14%, below the median of its peer group (High performing, Southeast peers, and SMIDs). We place a 14x multiple on our 2017E EPS, a premium to its peer group given above average expected EPS growth. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 3%.

Downside risks to our price objective are: 1) execution risk leading to slower than expected loan growth or lower than expected improvement in the efficiency ratio, 2)

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downturn in the local real estate markets affecting Franklin's construction loans and increasing credit costs via higher charge-offs and provisions, and 3) inability to effectively fund asset growth driving greater than expected compression in the net interest margin.

Goldman Sachs (GS)
We value the brokers based on the relationship between ROE (return on equity) and PB (price to book), which has a high historical correlation. Our $230 PO is based on a target PB multiple of 1.2x our forward book value estimate, which is above our 2017E ROE of roughly 10% as we add in higher interest rate expectations and loosening regulations into our multiple.

Risks to the downside are a weaker economy/capital markets, increased macro issues, tougher regulation, and litigation, while risks to the upside are a stronger economy, moderating macro risks, market share gains, and less onerous regulatory and legal issues.

Great Western Bancorp Inc (GWB)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $42 price objective and assign a 2.0x multiple to our 2Q17E TBV given that we believe the market would pay premium for GWB's 2016 estimated returns of 15%, in line with the median premium of its peer group (High performing, Midwest peers, and SMIDs). We place a 16x multiple on our 2017E EPS, a premium to its peer group given higher quality earnings. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 3%.

Downside risks to our price objective are a prolonged downturn in the farm sector and lower for longer interest rate environment. Upside risks are a better than expected improvement in the farming industry and a much stronger economic improvement in the Midwest economy.

Hancock Holding (HBHC)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $41 price objective. We assign a 1.5x multiple to our 2Q17E TBV, in line with SMID-cap peers based on their in-line return profile, and this translates to $35.75. We place a 14.5x multiple on our 2017E EPS, in line with other peers based on forecasted EPS growth, for $33. Our DCF assumes a two-stage model with terminal growth rate of 3.5% and a cost of capital of 8.5% to derive our $35 PO.

Downside risks to our price objective are regulatory issues, slowing growth and if M&A synergies do not materialize. Upside risks are better than expected cost saves, stronger loan growth that would lead to better than forecast spread revenue and lower credit costs.

Huntington Bancshares Inc. (HBAN)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our PO of $13 and assign a 1.8x multiple to 2017E TBV and a 14x multiple on 2017E EPS, below historical multiples. This is due to more stringent capital standards and the negative fee income impact of pending regulatory reform. Our DCF analysis uses a cost of equity of 15.7% in the first stage and 11% in the second stage, and a terminal growth rate of 3%.

Risks to our price objective are an inability to offset regulatory fee income headwinds and integration risk associated with FMER. Other risks are an inability to return capital to shareholders in a timely fashion or overpaying for an acquisition target.

IBERIABANK Corp (IBKC)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $85 price objective and assign a 1.6x multiple to our 2Q17E TBV, in line with multiples of other

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high growth peers. We place a 16x multiple on our 2017E EPS in line with SMID peers. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 3%.

Downside risks to our price objective are worse than expected decrease in oil prices, regulatory issues, deteriorating credit quality, and if M&A synergies do not materialize. Upside risks are sooner than expected recovery in the oil price, faster than expected rate hikes or better than expected improvement in the US economy.

Invesco (IVZ)
Our $36 price objective is based on a target P/E multiple of 14x our 2017E, which is above IVZ's historical valuation relative to the group given expectations for superior organic growth. Risks to our price objective are market depreciation and investment underperformance, as for all asset managers, along with volatile flows in IVZ's passive strategies, non-US currency and market risk.

JPMorgan Chase & Co. (JPM)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $83 PO, assigning a 1.5x multiple to 2017E TBV and 13x multiple on 2017E EPS. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%.

Near term, we view JPM's current market P/E multiple as overly discounted, but expect money center banks will likely continue to trade at a discount to the regionals. Our 11x multiple is a 2x discount to our median multiple as we believe in the near future, money centers will continue to trade at a discount to regional peers. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 4%.

Risks to our price objective are macro risks such as a longer than expected low interest rate environment and further regulation and scrutiny of the financials industry. Specific to JPM, risks are enhanced regulatory and capital standards as a Global SIFI, mortgage putback risk, material decline in investment banking/trading profitability, and increased litigation on matters such as private label securitization, foreclosures, etc.

Key Corp (KEY)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $18 PO and assign a 1.4x multiple to 2017E TBV and 15x multiple on 2017E EPS, in-line with its peer group due to near median profitability and EPS growth. Our DCF assumes a two stage cost of capital of 13.4% and 10.9% and a terminal growth rate of 5% and Tier 1 common of 8% at termination.

Downside risks to our PO are a prolonged low interest rate environment, greater than expected expenses, inability to maximize balance sheet efficiency, and the announcement of expensive deals.

KKR & Co. (KKR)
Our price objective (PO) for KKR is $17, which results in a target price-to-ENI (P/ENI or P/E) multiple of 10x our 2017 economic net income (ENI) estimate. Our price objective is based on our sum-of-the-parts (SOTP) analysis. Our SOTP analysis is based on the following components: a target multiple on fee related earnings (11x - discount to asset manager multiples given revenue mix), a discount to book value for the balance sheet investments and accrued carry given markets, and a discounted value on the performance fee upside over a cycle. Based on this method, we value the fee related earnings at $6/unit, the balance sheet (principal investments and accrued carry) at $9/unit, and the discounted value of future carry income and investment income at $2/unit, which equates to a total value of $17, in line with our price objective.

Risks to our PO: a weak macro and capital markets backdrop, potential changes in tax laws related to carried interest and partnerships, regulatory and political risk, poor

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performance, weak fundraising, principal investment and balance sheet risk, expansion risk, key person and talent risk, competition, a unique corporate structure that limits shareholder control, and share lock-ups that could weigh on the stock.

Legg Mason (LM)
Our $36 price objective is based on a target P/E multiple of 12x our calendar '17E, a discount to the group, given financial leverage, muted flows, and deal/integration risk. Downside risks to our price objective: an equity sell-off or weakening flows, which would pressure AUM and revenues. A return to past under-performance at key affiliates is also a risk for Legg, given its fragile recovery and brand issues. Given their affiliate model there are integration risks. Upside risks to our price objective are better than expected equity markets, performance, or flows, or an accretive acquisition.

Morgan Stanley (MS)
We value the brokers based on the relationship between ROE (return on equity) and PB (price to book), which has a high historical correlation. Our $43 PO is based on a target PB multiple of 1.3x our forward book value estimate, which is above our 2017E ROE of roughly 8% as we add in higher interest rate expectations and loosening regulations into our multiple.

Risks are a weak economy, low rates for longer, a significant reduction in capital markets activity, weak returns, another shock to the financial system, ongoing competition and talent risk, tighter regulation, significantly higher capital requirements, and ongoing litigation risks.

New York Community Bancorp (NYCB)
Our price objective is $17 and we use a three factor valuation model equally weighing valuations using P/E, P/TBV and DCF models. To arrive at our P/E valuation, we assign a 14x multiple to our blended '17e EPS or inline with the median of other CCAR banks with $50-100bn in assets. To arrive at our P/TBV valuation we applied a 2.2x multiple to our 2Q17E TBV, a premium to NY/Thrift and smid cap peers given NYCB's superior return profile. We arrive at our DCF valuation using we assume a 2% terminal growth rate and a WACC of 8%.

Upside risks to our price objective are: 1) Change in SIFI threshold could drive a relief rally, 2) Lower for longer rate backdrop, and 3) A period of heightened market volatility.

Downside risks to our price objective are: 1) worse than expected impact on ROTE from increased capital standards from obtaining the SIFI designation and 2) higher than expected impact from increasing rates on funding cost.

Prosperity Bancshares Inc (PB)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $58 price objective. We assign a 1.8x multiple to our 2Q17E TBV (40% weight) compared to 1.1x median of TX peers. We believe the 0.7x premium to Texas peers is warranted given PB's above average return on tangible equity (ROTE) profile. We place a 14x multiple on 2017E EPS, in line with historical P/E median (40% weight) net of accretable yield. Our DCF valuation ((20% weight) suggests a fair value of $45. Our DCF assumes a terminal growth rate of 3% and cost of capital of 9.9%.

Risks to our price objective are worse than expected drop in the price of oil, better than expected macro environment and increasing rates which offset the effects of lower oil prices, or inability to close an M&A deal due to regulatory or capital constraints.

Regions Financial (RF)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $13 price objective and assign a 1.4x multiple to 2017E TBV and 14x multiple on 2017E EPS. Our

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estimates imply RF would generate ROTEs of 10-11% in 2016-2017E, hence we find RF fairly valued at 1.3x TBV. Our 13x multiple is in-line with large regional peers. Our DCF assumes a two-stage cost of capital of 13.6% and 10.5% and a terminal growth rate of 6.5% and Tier 1 common of 8% at termination.

Downside risks to our PO are a slower-than-expected credit recovery, and the Fed on hold for a longer period of time.

Signature Bank (SBNY)
We use an equal-weighted three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $160 PO and assign a 2.1x multiple to 3Q17E TBV, representing a premium to the group, which we believe is appropriate given a stronger profitability and capital profile, and above-peer-growth prospects. Our 16.1x multiple on 2017E is higher than peers given consistent above peer growth. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 4%.

Risks to our price objective are required provisioning at higher-than-forecast levels, further deterioration in rental income for commercial properties, and a longer-than-anticipated low-rate environment.

SunTrust Banks, Inc. (STI)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $53 PO, assigning a 1.7x multiple to 2017E TBV and 14.5x multiple on 17E EPS. Above peer P/TBV due to their above median profitability, and below peer P/E due to their below median EPS growth. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%.

Our DCF assumes a two-stage cost of capital of 12% and a terminal growth rate of 4%.

Risks to our price objective are macro risks, such as a slower than expected rate increase. Upside risks are higher-than-expected capital return, a general beta rally for bank stocks, and faster recognition of "normalized" earnings.

SVB Financial Group (SIVB)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $165 price objective and assign a 1.8x multiple to our 2Q17E TBV and apply a 17x P/E to 17E EPS. Our valuation multiples are both in line with high growth peers due to SIVB's high profitability and EPS growth profile. Our DCF assumes a two-stage cost of capital of 9.5% and a terminal growth rate of 6%.

Downside risks are a longer than expected low rate environment and a slowdown in the technology sector and related IPO activity. Upside risks are sooner than expected rate hike, or better than expected pickup in the tech sector.

Synovus Financial Corp. (SNV)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $40 price objective and assign a 1.7x multiple to our forward 2Q17 TBV, given peers are currently trading higher and a discount is warranted given their lower return profile. We place a 15x multiple on 2017E EPS, in line with the historical median for the stock. Our DCF assumes a two-stage cost of capital of 9%, and a terminal growth rate of 3%.

Downside risks to our price objective are potentially slower-than-expected economic growth in their footprint or a potential takeout price that is lower than where the stock is trading today. Upside risks to our price objective are a quicker pick-up in capital return than we are expecting and SNV being acquired above our price objective.

TCF Financial Corp. (TCB)

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We use an equal weighted, three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our PO of $14. We assigned a 1.2x multiple to 2Q17E TBV and a 12x multiple on 2017E EPS, with lower PTBV/PE multiple than peers assigned due to the higher perceived risk of their lending model. Our DCF assumes a two-stage cost of capital of 9.4% and 11.5% and a terminal growth rate of 2%.

Upside risk to our price objective is a less onerous residential real estate cycle favorably benefiting credit provision forecasts. Downside risks are a double dip in home prices and a prolonged low rate environment.

Texas Capital Bancshares Inc. (TCBI)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $74 price objective and assign a 1.7x multiple to our 2Q17E TBV, below high growth peers due to possible losses as a result of the downturn in energy prices. We place a 17x multiple on our 2017E EPS, below TCBI's historical pre-crisis P/E multiple based on possible EPS headwinds from their energy exposures. Our DCF assumes a two-stage cost of capital of 10% and a terminal growth rate of 4%.

Downside risks to our price objective are lower than expected oil prices and a slowdown in economic activity in Texas. Upside risk to our price objective is better than expected ramp up in MCA business, and sooner than expected hike in rates, faster than expected recovery in oil prices.

The Blackstone Group (BX)
Our price objective (PO) for Blackstone is $29, which results in a target price-to-ENI (P/ENI or P/E) multiple of 12x our 2017 ENI estimate. Our price objective is based on our sum-of-the-parts (SOTP) analysis. Our SOTP analysis is based on the following components: a target multiple on fee related earnings (16x - roughly in line with or a premium to top tier asset manager multiples given healthy growth and sticky assets), book value for the balance sheet investments and accrued carry, and a discounted value on the performance fee upside over a cycle (1.5x MOIC). Based on this method, we value the fee related earnings at $14/unit, the balance sheet (principal investments and accrued carry) at $6/unit, and the discounted value of future carry income and investment income at $9/unit, which equates to a total value of $29, in line with our price objective.

Risks to our PO: a weak macro and capital markets backdrop, potential changes in tax laws related to carried interest and partnerships, legal and political risk, increased regulation, poor performance, weak fundraising, expansion risk, key person and talent risk, competition, and a unique corporate structure that limits unitholder control.

The Carlyle Group (CG)
Our price objective (PO) for Carlyle is $18, which implies a target price-to-ENI (P/ENI or P/E) multiple of 13x our 2017 ENI estimate. Our price objective is based on our sum-of-the-parts (SOTP) analysis. Our SOTP analysis is based on the following components: a target multiple on fee-related earnings (16x, roughly in line with or a premium to asset manager multiples given growth outlook), book value for the balance sheet investments and accrued carry, and a discounted value on the performance fee upside over a cycle (1.5x MOIC). Based on this method, we value the fee-related earnings at $4 share, the balance sheet at $5 share, and incentive upside at $9 share, which equates to a total value of $18, in line with our price objective.

Risks to our PO: a weak macro and capital markets backdrop, potential changes in carried interest and partnership tax laws, regulatory and political risk, poor performance, weak fundraising, expansion risk, key person and talent risk, competition, a unique corporate structure that limits shareholder control, a limited float, and share lock-ups that could weigh on the stock.

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The PNC Financial Services Group, Inc. (PNC)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $110 PO and assign a 1.4x multiple to 2017E TBV and 14x multiple on 2017E EPS, in line with target multiples for the median large regional banks under coverage. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%.

A superior profitability profile suggests an above peer multiple - however, a challenging macro backdrop and specific industry headwinds restrain our P/E target. Our DCF assumes a two-stage cost of capital of 9.6% and 11.2% and a terminal growth rate of 4%.

Risks are macro risks such as a lower for longer rate environment, the implementation of a strict liquidity coverage ratio and further regulation on overdraft income that restricts bank profitability.

U.S. Bancorp (USB)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $50 PO, assigning an above peer 2.8x multiple to 2017E TBV and near median 14.5x multiple on 2017E EPS due to their above median profitability. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%. Our DCF assumes a two-stage cost of capital of 9.5% and 10.9% and a terminal growth rate of 5%.

Risks to our price objective are macro risks such as a double dip recession, the implementation of a strict liquidity coverage ratio and further regulation on overdraft income that restricts bank profitability. Specific to USB, risks are enhanced regulatory scrutiny and capital standards as a Domestic SIFI and an announcement of a large expensive deal that could weigh on the stock price.

UMB Financial Corporation (UMBF)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $78 price objective and assign a 1.8x multiple to our 2Q17E TBV, in-line with peers, and we place a 18x multiple on our 2017E EPS, above peers given our above median EPS growth forecast. Our DCF model assumes cost of equity of 8% and a terminal growth rate of 4%.

Downside risks to our price objective are continued rising long rates, which could negatively impact the company's sizable securities book and erode tangible book value. In addition, a sudden outflow of deposits could impact EPS and the asset sensitivity of UMBF's balance sheet to higher interest rates. Upside risks to our price objective are a much faster asset mix change into higher yielding loans that significantly increases its net interest margin.

Wells Fargo & Company (WFC)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $55 PO, assigning a 1.75x multiple to 2017E TBV and 13x multiple on 2017E EPS. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%.

Our 1.6x TBV multiple represents a 0.3x premium to our mega-cap median multiple, but we believe this is justified due to WFC's superior returns on tangible equity (ROTE consistent between 13%-14% throughout our forecast period, versus 12% for peers). Our 12x EPS multiple is in line with our mega-cap median multiple. We believe WFC deserves to trade at a premium due to better earnings growth, but we are assuming WFC trades in line with peers due to a higher percentage of earnings from mortgage banking and accretable yield, as well as potentially greater regulatory scrutiny as the second largest US depository. Our DCF assumes a two-stage cost of capital of 11% and a terminal growth rate of 4%.

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Downside risks to our price objective are an economic slowdown and the final implementation of a strict liquidity coverage ratio. Specific to WFC, risks are enhanced regulatory scrutiny and capital standards as a Global SIFI, and issues surrounding its cross selling.

Zions Bancorp (ZION)
We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our $36 price objective and assign a 1.2x multiple to 2017E TBV. Our 16x P/E multiple, which we apply on 2017E EPS along with debt extinguishment upside, is 1x higher than its historical median due to low interest rates. Our DCF assumes a two-stage cost of capital of 16.1% and 11.6% and a terminal growth rate of 8%.

Upside risks to our price objective are more robust economic recovery and less onerous post cycle reserve requirements. Downside risks are a slowdown in housing price appreciation and a prolonged low interest rate environment.

Analyst Certification

We, Erika Najarian, Ebrahim H. Poonawala, Kenneth Bruce and Michael Carrier, CFA, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

Special Disclosures

BofA Merrill Lynch is currently acting as financial advisor to KKR and the Company in connection with its proposed sale of a majority stake in SMCP Group to Shandong Ruyi Group. The signing of an exclusivity agreement between the parties was announced on 31 March 2016.

BofA Merrill Lynch is currently acting as financial advisor to Huntington Bancshares Inc in connection with Huntington and FirstMerit Corp's proposed sale of 13 bank branches in Stark and Ashtabula counties to First Commonwealth Bank, a subsidiary of First Commonwealth Financial Corp, which was announced on July 27, 2016.

BofA Merrill Lynch is currently acting as financial advisor to Blackstone Group LP in connection with its proposed acquisition of Team Health Holdings Inc, which was announced on October 31, 2016. The proposed transaction is subject to approval by shareholders of Team Health Holdings Inc. This research report is not intended to (1) provide voting advice, (2) serve as an endorsement of the proposed transaction, or (3) result in the procurement, withholding or revocation of a proxy.

BofA Merrill Lynch is currently acting as financial adviser to Blackstone Real Estate Partners Europe IV and Blackstone Real Estate Partners VIII (jointly "Blackstone") through its entity Vega Holdco Sarl in connection with a proposed offer to acquire a controlling stake of D. Carnegie & Co. AB, which was announced on 15 July 2016. The transaction will, if completed eventually result in Blackstone passing the threshold for a mandatory offer obligation.

BofA Merrill Lynch is currently acting as financial advisor to Ares Capital Corp. in connection with its proposed acquisition of American Capital, Ltd., which was announced on May 23, 2016. Ares Management L.P. will provide financial support to the transaction. The proposed transaction is subject to approval by shareholders of American Capital ltd. and Ares Capital Corp. This research report is not intended to (1) provide voting advice, (2) serve as an endorsement of the proposed transaction, or (3) result in the procurement, withholding or revocation of a proxy.

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US - Brokers, Asset Managers, & Exchanges Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Affiliated Mgrs.	AMG	AMG US	Michael Carrier, CFA
	AllianceBernstein	AB	AB US	Michael Carrier, CFA
	BlackRock, Inc.	BLK	BLK US	Michael Carrier, CFA
	Charles Schwab Corp.	SCHW	SCHW US	Michael Carrier, CFA
	CME Group	CME	CME US	Michael Carrier, CFA
	Cohen & Steers	CNS	CNS US	Michael Carrier, CFA
	Goldman Sachs	GS	GS US	Michael Carrier, CFA
	Houlihan Lokey	HLI	HLI US	Michael Carrier, CFA
	IntercontinentalExchange	ICE	ICE US	Michael Carrier, CFA
	Invesco	IVZ	IVZ US	Michael Carrier, CFA
	KKR & Co.	KKR	KKR US	Michael Carrier, CFA
	Legg Mason	LM	LM US	Michael Carrier, CFA
	Morgan Stanley	MS	MS US	Michael Carrier, CFA
	Oaktree Capital Group	OAK	OAK US	Michael Carrier, CFA
	Old Mutual Asset Management	OMAM	OMAM US	Michael Carrier, CFA
	TD Ameritrade	AMTD	AMTD US	Michael Carrier, CFA
NEUTRAL				
	Apollo Global Management	APO	APO US	Michael Carrier, CFA
	Ares Management	ARES	ARES US	Michael Carrier, CFA
	E*TRADE Financial	ETFC	ETFC US	Michael Carrier, CFA
	Franklin Resources	BEN	BEN US	Michael Carrier, CFA
	Janus Capital	JNS	JNS US	Michael Carrier, CFA
	Nasdaq Inc	NDAQ	NDAQ US	Michael Carrier, CFA
	Och-Ziff	OZM	OZM US	Michael Carrier, CFA
	T. Rowe Price	TROW	TROW US	Michael Carrier, CFA
	The Blackstone Group	BX	BX US	Michael Carrier, CFA
	The Carlyle Group	CG	CG US	Michael Carrier, CFA
	WisdomTree	WETF	WETF US	Michael Carrier, CFA
UNDERPERFORM				
	Artisan Partners	APAM	APAM US	Michael Carrier, CFA
	CBOE Holdings	CBOE	CBOE US	Michael Carrier, CFA
	Eaton Vance	EV	EV US	Michael Carrier, CFA
	Federated Inv.	FII	FII US	Michael Carrier, CFA
	Virtus Investment Partners	VRTS	VRTS US	Michael Carrier, CFA
	Waddell & Reed	WDR	WDR US	Michael Carrier, CFA
RSTR				
	Bats Global Markets, Inc.	BATS	BATS US	Michael Carrier, CFA

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US - Specialty Financial Services Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Apollo Commercial Real Estate Finance	ARI	ARI US	Kenneth Bruce
	Ares Commercial Real Estate Corp.	ACRE	ACRE US	Kenneth Bruce
	Blackstone Mortgage Trust Inc	BXMT	BXMT US	Kenneth Bruce
	Compass Diversified Holdings	CODI	CODI US	Derek Hewett
	Ladder Capital Corp.	LADR	LADR US	Kenneth Bruce
	MGIC Investment Corp.	MTG	MTG US	Mihir Bhatia
	New Residential Investment	NRZ	NRZ US	Kenneth Bruce
	Radian Group Inc	RDN	RDN US	Mihir Bhatia
	Starwood Property Trust, Inc.	STWD	STWD US	Kenneth Bruce
	TCP Capital Corp.	TCPC	TCPC US	Derek Hewett
	TPG Specialty Lending, Inc.	TSLX	TSLX US	Derek Hewett
NEUTRAL				
	AGNC Investment Corp	AGNC	AGNC US	Kenneth Bruce
	Ally Financial Inc.	ALLY	ALLY US	Kenneth Bruce
	Amer Express	AXP	AXP US	Kenneth Bruce
	Annaly Capital	NLY	NLY US	Kenneth Bruce
	CIT Group Inc.	CIT	CIT US	Derek Hewett
	Discover Financial Services	DFS	DFS US	Kenneth Bruce
	Golub Capital BDC, Inc.	GBDC	GBDC US	Derek Hewett
	MasterCard Inc	MA	MA US	Kenneth Bruce
	PayPal	PYPL	PYPL US	Kenneth Bruce
	PennyMac Financial Services, Inc.	PFSI	PFSI US	Kenneth Bruce
	Synchrony Financial	SYF	SYF US	Kenneth Bruce
	Visa Inc.	V	V US	Kenneth Bruce
UNDERPERFORM				
	Apollo Investment Corporation	AINV	AINV US	Derek Hewett
	Capital One	COF	COF US	Kenneth Bruce
	Credit Acceptance Corp.	CACC	CACC US	Kenneth Bruce
	Essent Group	ESNT	ESNT US	Mihir Bhatia
	Goldman Sachs BDC, Inc.	GSBD	GSBD US	Derek Hewett
	OneMain Holdings, Inc.	OMF	OMF US	Kenneth Bruce
	PennyMac Mortgage Investment Trust	PMT	PMT US	Kenneth Bruce
	Santander Consumer USA Inc.	SC	SC US	Kenneth Bruce
RSTR				
	American Capital, Ltd.	ACAS	ACAS US	Derek Hewett
	Ares Capital Corporation	ARCC	ARCC US	Derek Hewett
RVW				
	AG Mortgage Investment Trust, Inc.	MITT	MITT US	Kenneth Bruce
	ARMOUR Residential REIT, Inc	ARR	ARR US	Kenneth Bruce
	CYS Investments, Inc	CYS	CYS US	Kenneth Bruce
	Ellington Financial LLC	EFC	EFC US	Kenneth Bruce
	Hannon Armstrong	HASI	HASI US	Kenneth Bruce
	Invesco Mortgage Capital, Inc.	IVR	IVR US	Kenneth Bruce
	Two Harbors Investment Corp.	TWO	TWO US	Kenneth Bruce
	Western Asset Mortgage Corp	WMC	WMC US	Kenneth Bruce

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US - Banks Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	BankUnited, Inc.	BKU	BKU US	Ebrahim H. Poonawala
	BB&T Corporation	BBT	BBT US	Erika Najarian
	Capital Bank Financial Corp.	CBF	CBF US	Erika Najarian
	Citigroup Inc.	C	C US	Erika Najarian
	Citizens Financial Group	CFG	CFG US	Erika Najarian
	East West Bancorp, Incorporated	EWBC	EWBC US	Ebrahim H. Poonawala
	FCB Financial Holdings, Inc	FCB	FCB US	Ebrahim H. Poonawala
	Great Western Bancorp Inc	GWB	GWB US	Ebrahim H. Poonawala
	Huntington Bancshares Inc.	HBAN	HBAN US	Erika Najarian
	IBERIABANK Corp	IBKC	IBKC US	Ebrahim H. Poonawala
	JPMorgan Chase & Co.	JPM	JPM US	Erika Najarian
	Key Corp	KEY	KEY US	Erika Najarian
	New York Community Bancorp	NYCB	NYCB US	Ebrahim H. Poonawala
	Signature Bank	SBNY	SBNY US	Ebrahim H. Poonawala
	SunTrust Banks, Inc.	STI	STI US	Erika Najarian
	SVB Financial Group	SIVB	SIVB US	Ebrahim H. Poonawala
	The PNC Financial Services Group, Inc.	PNC	PNC US	Erika Najarian
	UMB Financial Corporation	UMBF	UMBF US	Ebrahim H. Poonawala
	Wells Fargo & Company	WFC	WFC US	Erika Najarian
NEUTRAL				
	Banc of California	BANC	BANC US	Ebrahim H. Poonawala
	Commerce Bancshares Inc.	CBSH	CBSH US	Ebrahim H. Poonawala
	Fifth Third Bank	FITB	FITB US	Erika Najarian
	First Bancorp Puerto Rico	FBP	FBP US	Ebrahim H. Poonawala
	First Hawaiian Inc.	FHB	FHB US	Ebrahim H. Poonawala
	Franklin Financial Network, Inc.	FSB	FSB US	Ebrahim H. Poonawala
	Hancock Holding	HBHC	HBHC US	Ebrahim H. Poonawala
	M&T Bank	MTB	MTB US	Erika Najarian
	Regions Financial	RF	RF US	Erika Najarian
	Synovus Financial Corp.	SNV	SNV US	Ebrahim H. Poonawala
	Texas Capital Bancshares Inc.	TCBI	TCBI US	Ebrahim H. Poonawala
	U.S. Bancorp	USB	USB US	Erika Najarian
UNDERPERFORM				
	Associated Banc-Corp	ASB	ASB US	Ebrahim H. Poonawala
	Bank of Hawaii Corp.	BOH	BOH US	Ebrahim H. Poonawala
	Comerica Incorporated	CMA	CMA US	Erika Najarian
	Cullen/Frost Bankers Inc	CFR	CFR US	Ebrahim H. Poonawala
	First Horizon National Corp.	FHN	FHN US	Ebrahim H. Poonawala
	Prosperity Bancshares Inc	PB	PB US	Ebrahim H. Poonawala
	TCF Financial Corp.	TCB	TCB US	Ebrahim H. Poonawala
	Zions Bancorp	ZION	ZION US	Erika Najarian
RSTR				
	First Republic Bank	FRC	FRC US	Erika Najarian

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Equity Investment Rating Distribution: Banks Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	81	43.55%	Buy	74	91.36%
Hold	45	24.19%	Hold	41	91.11%
Sell	60	32.26%	Sell	56	93.33%

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Equity Investment Rating Distribution: Financial Services Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	113	46.89%	Buy	89	78.76%
Hold	66	27.39%	Hold	55	83.33%
Sell	62	25.73%	Sell	40	64.52%

Equity Investment Rating Distribution: Global Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1553	49.44%	Buy	1130	72.76%
Hold	730	23.24%	Hold	538	73.70%
Sell	858	27.32%	Sell	514	59.91%

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

* Ratings dispersions may vary from time to time where BofA Merrill Lynch Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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From: Ens, Amanda [[redacted]
Sent: 11/17/2016 8:55:12 PM
To: jeffrey E. [jeevacation@gmail.com]; Richard Kahn [redacted]
Subject: USDJPY testing 110. Buy Japan upside
Attachments: image001.png; image002.png; image003.png; image004.jpg; image005.jpg; image006.jpg; image007.jpg; image008.png; image009.jpg; image010.jpg; image011.jpg; image012.gif; Nikkei to 20000.pdf; Japan - Ready for ignition.pdf; Japan Macro Watch.pdf

Importance: High

Buy DXJ Jan 50/52 Call Spread for $0.35, ref 47.45, 13d. 4.7X net payout

We can also discuss single stock and Topix banks index (TPNBNK) ideas

The Republican sweep means higher USD and yields are a foregone conclusion. We see USDJPY reaching 120 next year and Japanese reflation, bullish for Japanese equities, particularly the banks.

- Huge focus on Banks/Financials post Trump election, they're the big winners.
- The Banking sector is the main beneficiary of higher rates/less regulation overhang.
- Investors are still underweight Japan. Especially in financials, so the move can have legs
- Valuation still at depressed levels. Japanese Banks are cheap versus their peers.
- Having said that, uncertainty still there so buying calls and call spreads makes sense. Some investors are still skeptical. Instead of building a large cash position, we believe options are a better play in case the market reverses and initiates a risk off move again.

-BAML expects USDJPY 115-120 by end of 2017. NKY target of 20,000 (12% upside)
-BOJ's intentions to refrain from further flattening of local yield curve positive for Banks and Insurers.
-DXJ carries a **12% weight in banks** whereas NKY is only 1.07% and even TPX is only 8.55%.
-Positioning light. DXJ shares outstanding at 3year lows as foreigners have net sold $52bln of JP equities ytd.
-DXJ skew remains flat. 2m 25d Put /Call skew at 19%tile over the past year.

Japan Investment Strategy, Japan Econ Outlook and Japan Macro Watch attached

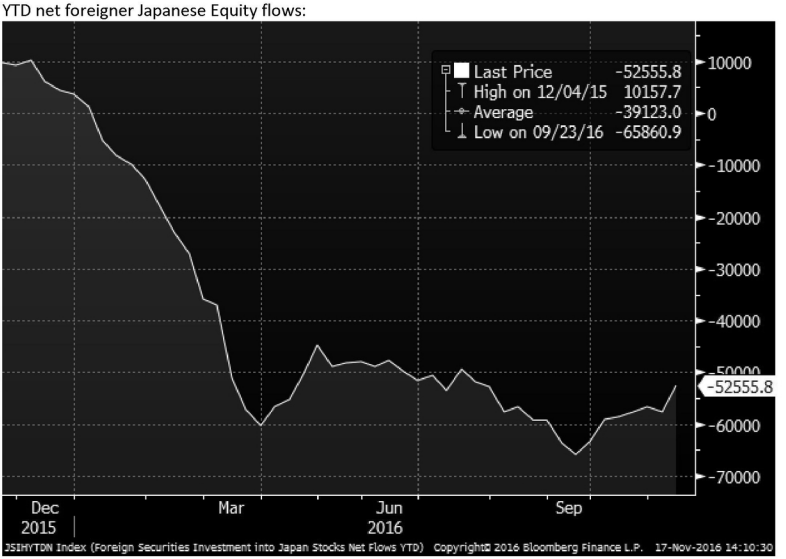
DXJ 2m 25d Put/Call over the past year.

Source: Bloomberg

DXJ ETF shares outstanding remain at 3 year lows.

Source: Bloomberg

YTD net foreigner Japanese Equity flows:



Source: Bloomberg

Amanda Ens
Director | Global Equities
Bank of America Merrill Lynch
Merrill Lynch, Pierce, Fenner & Smith Incorporated

[redacted]

Japan Investment Strategy

Nikkei to 20,000: Inventory cycle upturn → cyclicals; inflation → banks, insurance

Investment Strategy

18 November 2016

Key takeaways

- Solid macro and weaker JPY positive for Japan equities, which also tend to outperform when US rate rises (esp. steepening)
- The inventory cycle continues to recover on fiscal easing and capex, implying cyclical stocks will outperform
- Inflation and higher yields positive for banks, insurance. Risk is diplomacy, protectionism, and US economic cycle

FULL REPORT

Bullish equities 2017; rotation into cyclicals, banks, insurance

We are bullish Japan equities for 2017 and we estimate the Nikkei 225 index will recover to 20,000 by end-2017 (see $/¥'s eventual surge: Buy Nikkei 06 September 2016). Our new Chief Japan Economist Izumi Devalier forecasts above-consensus Japan GDP growth and inflation in 2017, which is also supportive of our bullish equities scenario (see Ready for ignition 18 November 2016). We expect rotation into cyclicals, banks and insurance as explained below.

1) Upturn in inventory cycle: Defensives→Cyclicals

We expect cyclicals to outperform defensives, premised on our end-2017 $/¥ estimate of ¥120, and this is supported by our above-consensus economic growth outlook. Our Japan economist sees a shift to fiscal easing, firms countering the tight labor market by increasing capex, and estimates industrial production to grow 3.5% and 3.6% in 2017 and 2018, respectively. With the inventory cycle exiting a "contraction" phase and entering a "recovery" phase, conditions are likely to remain conducive to cyclicals outperforming defensives (Chart 1, Exhibit 3).

2) Higher inflation, rates: Deflation stocks→Inflation stocks

Up to 1H16, the Japan equity market saw continued preference for deflationary stocks as domestic inflation remained subdued and the JGB curve underwent excessive bull flattening. Defensives outperformed cyclicals (Chart 1), growth outperformed value (Chart 2), and stocks that benefit from a low-yield environment (REITs) outperformed the converse (banks, insurance; Chart 3). However, we expect conditions to reverse into 2017. We see US Treasury yields rising and Japanese core CPI inflation recovering to +1.4% yoy by 2018 and core-core to +1.1% yoy. Stronger inflation and higher foreign yields should steepen the JGB yield curve above10yr, while below 10yr should escape from downward pressure as BoJ rate cut expectations recede. Against this backdrop, we expect to see a rotation from deflation to inflation stocks, which in addition to cyclicals means banks and insurance should outperform REITs within the financial sector (Chart 3). This is also in line with the global rotation expected by Michael Hartnett (The Flow Show: The Inflation Era Begins 10 November 2016).

3) Nikkei winner of steeper UST and strong macro

In a scenario of strong external demand and US rate hikes (particularly with curve steepening), Japan equities tend to be the winner on a local currency basis, led by cyclicals, banks and insurance stocks (Exhibit 4). Resurgence in the "Japan macro trade" of short yen / buy equities is also a possibility.

Our Buy-rated stocks in bank, insurance and cyclical sectors are listed in Table 1.

Shusuke Yamada, CFA
FX/Equity Strategist
Merrill Lynch (Japan)
[redacted]

Japan Economics Viewpoint

Ready for ignition

18 November 2016

Key takeaways

- We are upbeat on Japan's outlook and think consensus is underestimating the strength of medium-term GDP and inflation.
- While the consensus looks for just 0.8% growth next year, we expect growth of 1.4% in CY17 and 1.2% in CY18.
- With inflation moving in the right direction, we expect BoJ to keep its rates targets unchanged for the foreseeable future.

WATCH THE VIDEO

FULL REPORT

Consensus underestimating GDP and inflation

We are upbeat on Japan's outlook and think consensus is underestimating the strength of medium-term GDP and inflation. We expect growth of 1.4% in CY2017 and 1.2% in CY2018, well above consensus of just 0.8% growth next year. For the first time in four years both monetary and fiscal policy are supporting growth. The combination of modestly higher commodity prices, a weaker yen, and a tightening output gap should drive Japan-style core inflation to 1.0% in CY2017, and 1.4% in CY2018. We expect the BoJ to keep its rate targets unchanged for the foreseeable future as inflation moves in the right direction.

Fiscal and monetary policy realigning

For years Japan has oscillated between loose and tight fiscal policy. Japanese policymakers now seem to be on the same page and we see little risk of another policy error. If anything, we see upside risks from greater fiscal stimulus via a third supplementary budget or a relatively aggressive FY17 ordinary budget. Meanwhile,

the BoJ's new interest-pegging regime ensures that financial conditions will become increasingly stimulatory as inflation rises.

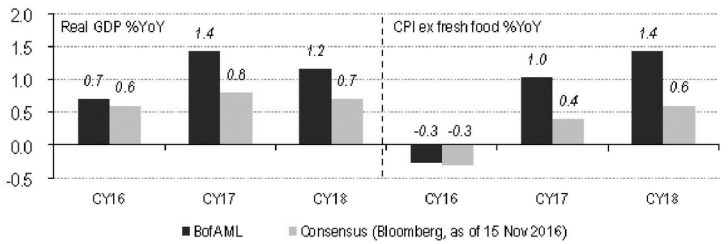
2017 - a year of recovering domestic demand

We think the economy is heading towards a cyclical sweet spot and see a broad-based recovery in domestic demand. Specifically, 1) consumption is poised to rebound as the saving rate peaks; 2) capex should accelerate in response to the improving demand outlook, deepening supply-side constraints, and "low-for-longer" real rates; and 3) increased efforts by policymakers to accelerate income redistribution could push up the velocity of money at the margin, helping to reflate the economy.

Biggest risk factor: US policy uncertainty

External developments pose the greatest risk to our forecasts, chief among them US policy uncertainty. The downside scenario for Japan is a combination of rising US protectionism, sliding global trade, and a stronger yen, which could reduce 2017 growth to zero. The Trump presidency may increase pressure on Japan to achieve greater military self-reliance, boosting defense spending. There will also be greater incentives to deepen economic and trade linkages with key regional players, such as China and Russia.

Chart 1: We think consensus is underestimating the strength of medium-term GDP and inflation



Source: BofA Merrill Lynch forecasts, Bloomberg

Izumi Devalier
Japan Economist
Merrill Lynch (Japan)
[redacted]

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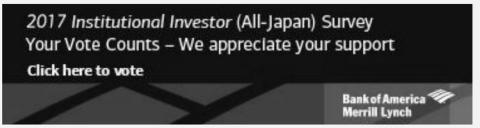

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Nikkei to 20,000: Inventory cycle upturn → cyclicals; inflation → banks, insurance

Bank of America Merrill Lynch

18 November 2016

Bullish equities 2017; rotation into cyclicals, banks, insurance

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Investment Strategy
Japan

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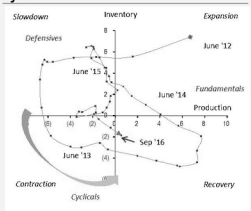
Exhibit 1: Sector rotation and inventory cycle



Source: BofA Merrill Lynch Global Research, Bloomberg, Haver

Exhibit 2: Shares rated Buy by our analysts in cyclical, bank and insurance sectors*

Company	Ticker	Company	Ticker	Company	Ticker
Mitsubishi UFJ FG	8306 JP	Daiichi Life	8750 JP	JR East	9020 JP
Japan Post Bank	7182 JP	MS&AD Holdings	8725 JP	JR Central	9022 JP
SMFG	8316 JP	Sompo Holdings	8630 JP	Nintendo	7974 JP
Resona HD	8308 JP	Shin-Etsu Chem	4063 JP	Recruit HD	6098 JP
Mitsubishi Elec	6503 JP	FUJIFILM	4901 JP	Oriental Land	4661 JP
Nidec	6594 JP	Sony	6758 JP	Fuji Heavy Ind	7270 JP
Hitachi	6501 JP	NTT DATA	9613 JP	Suzuki Motor	7269 JP
Panasonic	6752 JP	NSSMC	5401 JP		

Source: BofA Merrill Lynch Global Research
*Market cap above 1.5trn JPY except bank, insurance shares

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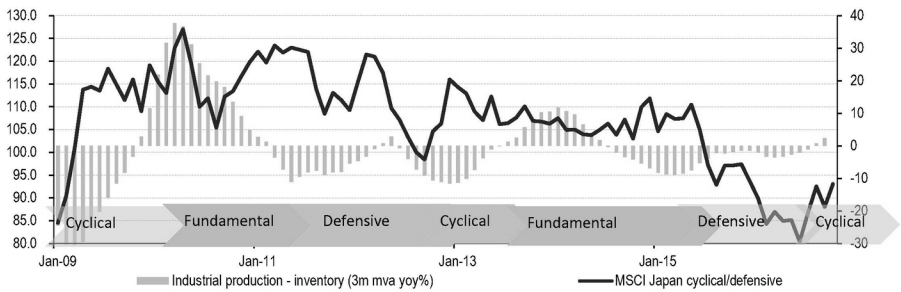
Risks: Geopolitics, diplomacy and US economic cycle

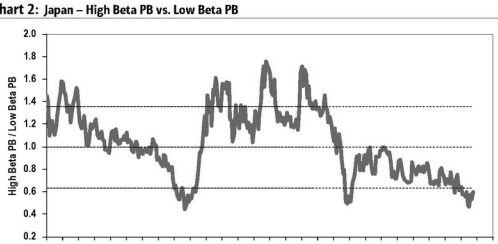
The biggest risk to our scenario is the implications for Japan's diplomatic and geopolitical environment of the Donald Trump presidency in the US. The likelihood of agreement on the TPP (Trans-Pacific Partnership) has already declined and been priced into the market, but any downward spiral in Japan-US relations would likely be further negative for Japan equities near-term. A rise in protectionism would be negative for stocks with high US export exposure. Meanwhile if the US economy slows or enters recession and the protectionist response weakens USD, it would be negative for Japanese cyclicals, particularly exporters, due to stronger JPY and potential trade conflicts. Moreover, a potential improvement in US-Russia (US-China) relations under the new US President most likely implies a relative worsening in Japan-Russia (Japan-China) relations. On the other hand, we expect Japan to move closer to Europe under such a scenario, raising the incentive to sign the Japan-EU EPA (Economic Partner Agreement), positive for related stocks. If the Trump presidency tips the US towards isolationism, we expect Japan's spending on defense to increase. If this results in higher spending on Japan's Self Defense Forces (rather than compensating for US spending on Japan-based US military), Japan's defense-related stocks would be beneficiaries, and it could reshape the arms industry in Japan.

Chart 1: Sector rotation and inventory cycle



Source: BofA Merrill Lynch Global Research, Bloomberg, Haver
Cyclical = Industrials, consumer discretionary, IT, materials
Defensive = Healthcare, telecom, consumer staples, utilities
Calculated cyclical and defensive % change using monthly index return and index weight

Chart 2: Japan – High Beta PB vs. Low Beta PB



Source: BofA Merrill Lynch Global Quantitative Strategy, MSCI, IBES
Global Quant Panorama: Surf for longer 14 November 2016

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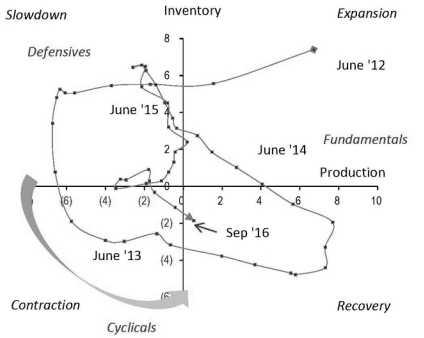
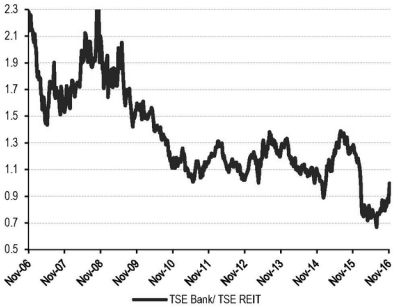
Exhibit 3: Sector rotation and inventory cycle



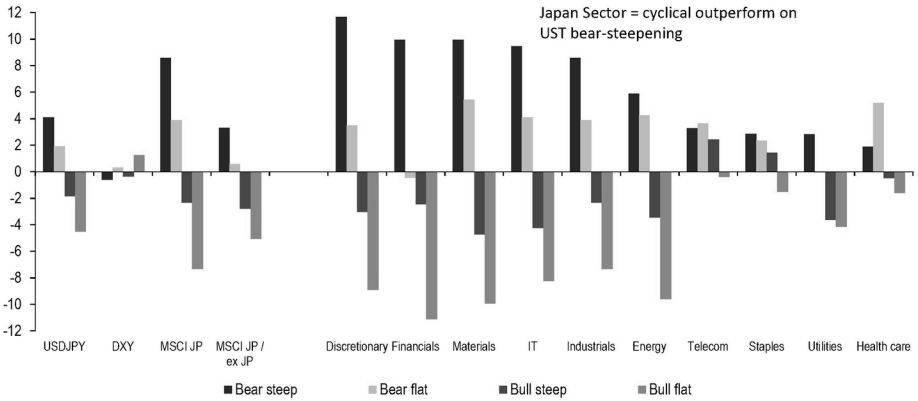
Source: BofA Merrill Lynch Global Research, Bloomberg, Haver

Chart 3: Higher inflation/yields suggests banks will outperform REITs



Source: BofA Merrill Lynch Global Research, Bloomberg,

Exhibit 4: Reactions to US Treasury curve moves (%, simple average of past 43 quarters) – Japan equities have outperformed during bear-steepening led by cyclicals, banks and insurance



Source: BofA Merrill Lynch Global Research, Bloomberg.
Curve movements based on 2yr move and 2s10s move (Bloomberg US Treasury yield index), so includes twist movements, but even if we exclude these implications do not materially change.
Bear steepening (2yr + 16bps, 2s10s +33bps) = 11 quarters, bear flattening (2yr +26bps, 2s10s -20bps) = 10 quarters, bull steepening (2yr -48bps, 2s10s +28bps) = 10 quarters, bull flattening (2yr -27bps, 2s10s -30bps) = 12 quarters

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Table 1: Shares rated buy by our analysts in cyclical, bank and insurance sectors*

Company Name	Ticker	Industry (JPX definition)	Price	MKT CAP (Billion Yen)	Analyst Name
Mitsubishi UFJ FG	8306 JP	Banks	683	9,674	Futoshi Sasaki
Japan Post Bank	7182 JP	Banks	1331	5,990	Futoshi Sasaki
SMFG	8316 JP	Banks	4190	5,925	Futoshi Sasaki
Resona HD	8308 JP	Banks	538	1,251	Futoshi Sasaki
Mitsubishi Elec	6503 JP	Electric Appliances	1592	3,418	Mikio Hirakawa
Nidec	6594 JP	Electric Appliances	10460	3,035	Masashi Kubota
Hitachi	6501 JP	Electric Appliances	588	2,658	Mikio Hirakawa
Panasonic	6752 JP	Electric Appliances	1033	2,533	Mikio Hirakawa
Dai-ichi Life	8750 JP	Insurance	1850	2,202	Futoshi Sasaki
MS&AD Holdings	8725 JP	Insurance	3405	2,085	Futoshi Sasaki
Sompo Holdings	8630 JP	Insurance	3684	1,506	Futoshi Sasaki
Shin-Etsu Chem	4063 JP	Chemicals	8328	3,599	Takashi Enomoto
FUJIFILM	4901 JP	Chemicals	4095	1,906	Hiroyasu Eguchi
Sony	6758 JP	Electric Appliances	3226	4,075	Mikio Hirakawa
NTT DATA	9613 JP	Information & Communication	5530	1,551	Hiroyasu Eguchi
NSSMC	5401 JP	Iron & Steel	2384	2,266	Takashi Enomoto
JR East	9020 JP	Land Transportation	9542	3,743	Yasuhito Tsuchiya
JR Central	9022 JP	Land Transportation	17825	3,672	Yasuhito Tsuchiya
Nintendo	7974 JP	Other Products	26050	3,129	Hiroyasu Eguchi
Recruit HD	6098 JP	Services	4340	2,453	Yoshiyuki Kinoshita
Oriental Land	4661 JP	Services	5957	1,991	Rie Sakai
Fuji Heavy Ind	7270 JP	Transportation Equipment	4320	3,371	Kei Nihonyanagi
Suzuki Motor	7269 JP	Transportation Equipment	3711	1,637	Kei Nihonyanagi

Source: BofA Merrill Lynch Global Research

*Cyclical sectors = Industrials, consumer discretionary, IT, materials in GICS definition

*Market cap above 1.5tm JPY except bank, insurance shares

*Exclude Fast Retailing

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
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Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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Japan Economics Viewpoint
Ready for ignition

Bank of America Merrill Lynch

18 November 2016

Economics
Japan

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Consensus underestimating GDP and inflation

We are upbeat on Japan's outlook and think consensus is underestimating the strength of medium-term GDP and inflation. We expect growth of 1.4% in CY2017 and 1.2% in CY2018, well above consensus of just 0.8% growth next year. For the first time in four years both monetary and fiscal policy are supporting growth. The combination of modestly higher commodity prices, a weaker yen, and a tightening output gap should drive Japan-style core inflation to 1.0% in CY2017, and 1.4% in CY2018. We expect the BoJ to keep its rate targets unchanged for the foreseeable future as inflation moves in the right direction.

Fiscal and monetary policy realigning

For years Japan has oscillated between loose and tight fiscal policy. Japanese policymakers now seem to be on the same page and we see little risk of another policy error. If anything, we see upside risks from greater fiscal stimulus via a third supplementary budget or a relatively aggressive FY17 ordinary budget. Meanwhile, the BoJ's new interest-pegging regime ensures that financial conditions will become increasingly stimulatory as inflation rises.

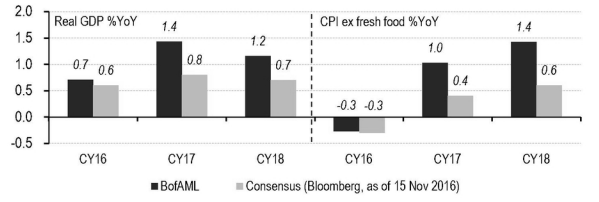
2017 – a year of recovering domestic demand

We think the economy is heading towards a cyclical sweet spot and see a broad-based recovery in domestic demand. Specifically, 1) consumption is poised to rebound as the saving rate peaks; 2) capex should accelerate in response to the improving demand outlook, deepening supply-side constraints, and "low-for-longer" real rates; and 3) increased efforts by policymakers to accelerate income redistribution could push up the velocity of money at the margin, helping to reflate the economy.

Biggest risk factor: US policy uncertainty

External developments pose the greatest risk to our forecasts, chief among them US policy uncertainty. The downside scenario for Japan is a combination of rising US protectionism, sliding global trade, and a stronger yen, which could reduce 2017 growth to zero. The Trump presidency may increase pressure on Japan to achieve greater military self-reliance, boosting defense spending. There will also be greater incentives to deepen economic and trade linkages with key regional players, such as China and Russia.

Chart 1: We think consensus is underestimating the strength of medium-term GDP and inflation



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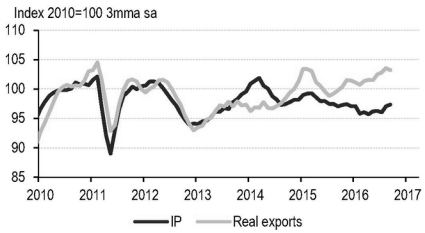
Escape from zero

The Q3 CY16 GDP print confirms our view that Japan has at last emerged from the de facto zero-growth trap of the past few years. Growth accelerated to an above-consensus 2.2% q-o-q saar, after a 0.7% rise in Q2 CY16 and 2.1% rise in Q1 CY16. We expect a moderation in Q4 CY16, but underlying growth will remain firmly in the 1.0-1.5% range. We are currently tracking CY2016 growth of 0.7%, a modest improvement from 0.6% in CY2015, though the switch to a new GDP standard[1] next month raises uncertainty around our forecasts.

Upturn in exports to be sustained through Q3 CY17

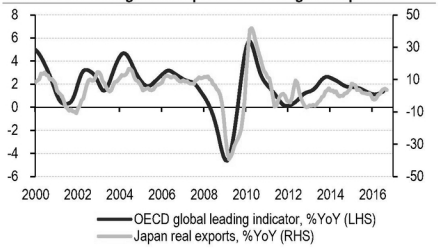
The recent recovery has been driven by a fading consumption tax shock and stronger exports. The downturn in the global industrial cycle in 2014-16 hurt Japan, but manufacturing activity bottomed out early this year and is now modestly expanding (Chart 2). The OECD leading indicator continues to signal a synchronized pick-up in global growth (Chart 3). The domestic inventory cycle also points to production gains ahead (Chart 4). For Japanese exporters, the improvement in demand has been most visible for Europe (Chart 5). US and Chinese demand will likely follow, though the mainland's structural shift to services implies only a modest acceleration. We expect the current up-cycle in global exports to be sustained through Q3 CY17 – possibly longer depending on developments in the US (more on this later). The combination of stronger external demand and a weaker currency should shore up business confidence, especially among manufacturers, and lay the foundations of Japan's recovery.

Chart 2: Industrial activity has bottomed out



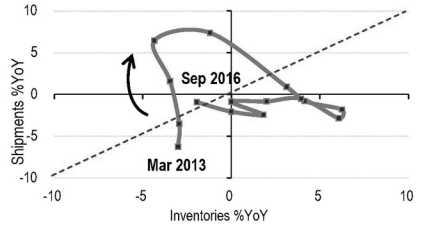
Source: BofA Merrill Lynch Global Research, METI, BoJ

Chart 3: OECD leading indicator points to modest global expansion



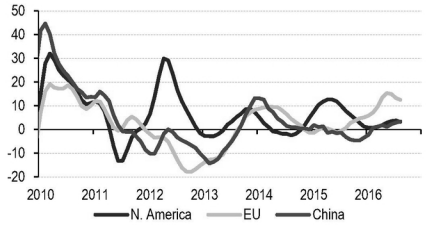
Source: BofA Merrill Lynch Global Research, OECD, BoJ

Chart 4: The shipment-inventory cycle points to production gains ahead



Source: BofA Merrill Lynch Global Research, METI

Chart 5: Japan's real exports by destination, 3mma %YoY



Source: BofA Merrill Lynch Global Research, BoJ

[1] Japan will switch to SNA2008 methodology, starting with the release of revised Q3 CY16 GDP due 8 December 2016.

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Automatic easing

Policy headwinds are also abating: for the first time since 2013, both fiscal and monetary policy are poised to turn stimulatory in 2017.

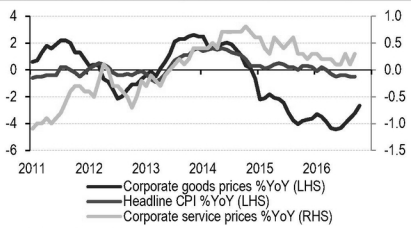
Monetary policy: BoJ pegs to zero

The BoJ's transition to yield-curve targeting ensures that real yields will drop as inflation picks up, implying that financial conditions will turn increasingly loose as the recovery progresses. There are good reasons to be cautiously optimistic: after all, despite a triple whammy of weak domestic demand, weak commodity prices, and a stronger yen, Japanese inflation measures are showing early signs of bottoming out (Chart 6).

We expect Japan-style core inflation (CPI ex fresh food) to trough in Q4 CY16, after which it should accelerate relatively quickly in the first two quarters of 2017 in response to 1) a recovery in crude oil prices, 2) a weaker yen (we assume USDJPY rebounds to 120 by the end of the year), and 3) stronger wage growth. This also implies stronger core-core inflation (CPI ex food & energy). We are bullish on all three factors and see CY17 core inflation running at an above-consensus 1.0% and 1.4% in CY18.

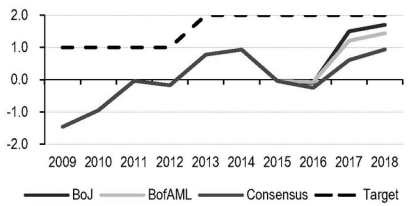
This is still short of the central bank's 2% target (Chart 7). But we believe there will be little pressure to lower rates further, especially against the backdrop of a weakening yen and rising global yields. More broadly, things are moving in the right direction for the BoJ. The private sector has been steadily re-leveraging, albeit gradually. Meanwhile, labor markets continue to tighten and wage growth is slowly improving: the 4-quarter moving average for hourly wages is now up to 1.2% y-o-y (Chart 8). With the labor market for lower-cost part-time workers nearing saturation, growth in higher-quality, full-time jobs is picking up (Chart 9). We expect a moderation in employment gains and faster wage growth ahead.

Chart 6: Produce and consumer price inflation (ex-tax effect)



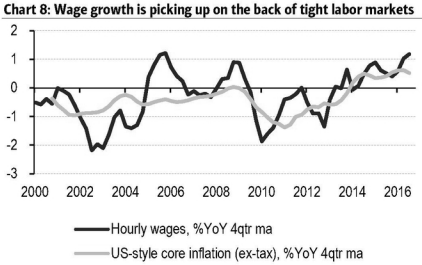
Source: BofA Merrill Lynch Global Research, MIA

Chart 7: Japan-style core inflation (CPI ex fresh food) forecasts (FY basis)



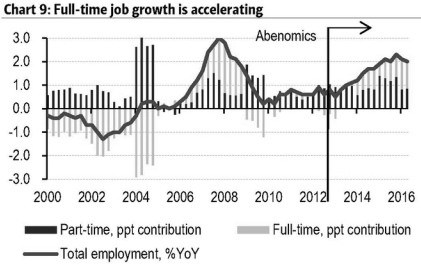
Source: BofA Merrill Lynch Global Research, BoJ, JCER *Consensus is JCER ESP survey

Chart 8: Wage growth is picking up on the back of tight labor markets



Source: BofA Merrill Lynch Global Research, MHLW, MIA

Chart 9: Full-time job growth is accelerating



Source: BofA Merrill Lynch Global Research, MIA

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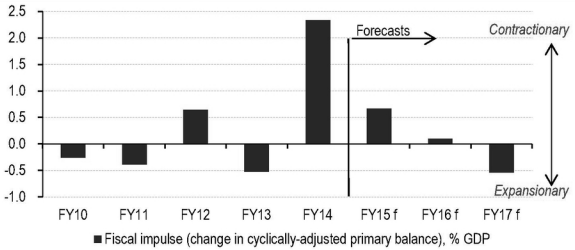
Fiscal policy: turning looser in FY17

Fiscal policy is undergoing an equally important shift. In August, the Cabinet approved an economic stimulus package totaling JPY28trn (roughly 5.5% of GDP). Though "real water" government spending is a comparatively modest JPY7.5trn (1.5% of GDP), this is enough to put the fiscal impulse back in expansionary territory, after three years of tightening (Chart 10). The stimulus measures, which are centered on public investment and cash transfers to households, should boost CY2017 GDP by 0.5ppt. Public construction orders are already rebounding as the government front-loaded public infrastructure spending (Chart 11). Meanwhile, the next stage of the consumption tax increase has been postponed until October 2019.

Chart 10: After 3 years of tightening, fiscal policy to turn loose in FY17

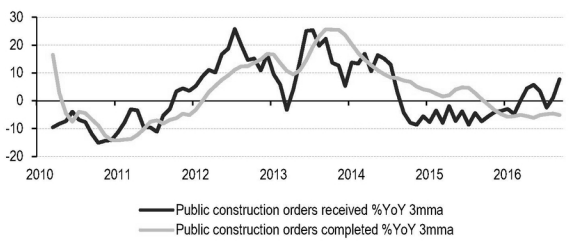


Source: BofA Merrill Lynch Global Research, IMF, CAO

To be clear, we are not talking about massive shifts in the fiscal stance here—the Ministry of Finance remains very much opposed to expanding the deficit and Prime Minister Abe has yet to abandon the government's long-standing goal of balancing the primary balance by FY2020.

However, there is a growing consensus among Japanese policymakers that premature fiscal tightening is counter-productive for reflation efforts, especially when monetary policy is stretched. Even BoJ Governor Kuroda, who initially underplayed the risks from 2014 fiscal tightening, has recently acknowledged that loose monetary and fiscal policies will have a "synergistic effect." The upshot is that the risk of another policy error is low, in our view. If anything, we see upside risks from greater fiscal stimulus in the form of a third supplementary budget or relatively aggressive FY17 ordinary budget. We would not rule out further delays to the October 2019 consumption tax hike, either.

Chart 11: Public investment is poised to pick up in the months ahead



Source: BofA Merrill Lynch Global Research, MITI

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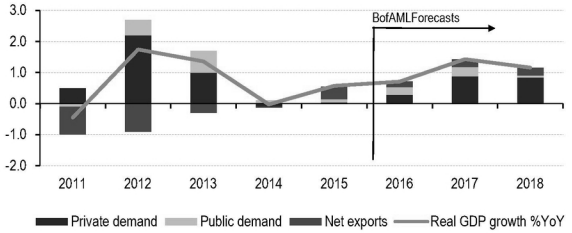
2017: a good year for domestic demand

Policy tailwinds are only one pillar of our call for Japan's outperformance in 2017. We also believe the stars are aligning for an organic improvement in domestic demand, which would support the current recovery: the economy is firing on all cylinders for the first time since 2013, and growth should accelerate to 1.4% in CY2017, followed by 1.2% expansion in CY2018 (Chart 12).

We see three catalysts: a consumer comeback, stronger capex, and a shift in income away from high-saving corporations in favour of higher-spending households and stockholders.

Chart 12: Steady improvement in growth, led by domestic demand



Source: BofA Merrill Lynch forecasts, CAO

1. Consumer comeback

Households have been the noticeable laggard in the current recovery and the main reason why Japan's economy has barely grown since the 2014 consumption tax hike. This is not for a lack of income growth: real employee compensation (wages + employment) has staged an impressive recovery of late, rising 1.2% in CY15, and an estimated 1.9% in CY16 (Chart 13).

One explanation is that private consumption is simply being underestimated in demand-side GDP statistics: researchers at the Bank of Japan recently produced experimental supply-side estimates of GDP that were significantly higher than existing expenditure-side statistics.[2] We find the BoJ research interesting and agree that Japanese consumption statistics are beset by data quality issues. But this alone cannot account for the consumption slump. We think two factors are equally to blame for depressed household spending: 1) a squeeze on disposable income from higher taxes and social security contributions; and 2) a surge in the saving rate (Chart 14).

Calling Japan right in 2017 is largely about correctly forecasting whether these two trends will reverse. We see several reasons for optimism. First, we expect real employee compensation to accelerate further, driven by a continued pick-up in per capita wages. The call on the saving rate is admittedly trickier. But having surpassed the 2006 highs, we think it is unlikely to surge further, given that consumer confidence is improving and income growth is firming. FY17 tax reforms are also likely to support household sentiment at the margin: for example, discussions are underway about enlarging tax cuts for second-earners who work part-time. Overall, we expect private consumption to rise 1.0% in CY17, adding 0.6ppt to growth.

Should the saving rate stabilize, as we expect, consumption should again start rising in tandem with compensation. Investors should not have to wait long to get some visibility around these trends. We expect the saving rate to peak in Q4 CY16 and consumption to rise strongly from this quarter.

[2] Link to the research paper (in Japanese only): https://www.boj.or.jp/research/wps_rev/wps_2016/data/wp16j09.pdf

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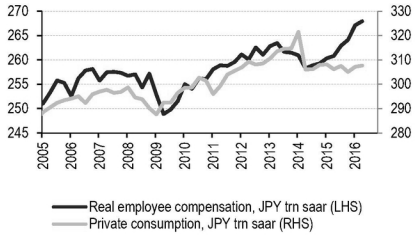
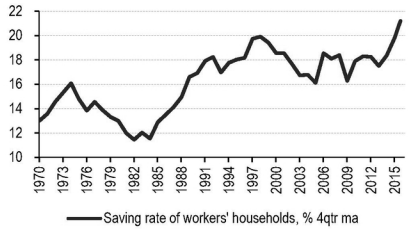
Chart 13: Real labor income and private consumption



Source: BofA Merrill Lynch Global Research, CAO

Chart 14: Workers' saving rate at all-time high



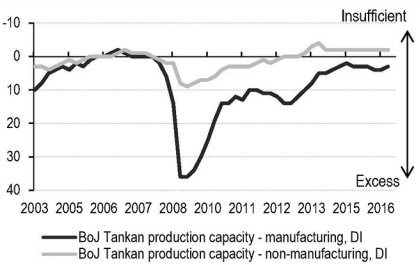
Source: BofA Merrill Lynch Global Research, MIA

2. Capex revival

We also see a fundamental case for higher capital spending. Borrowing rates are very low and will fall further in real terms as inflation rises. Stronger growth and improved confidence should also encourage higher capex. And deepening supply-side constraints offer a strong incentive for Japan Inc. to accelerate productivity-enhancing capex, ensuring that this expansion is durable.

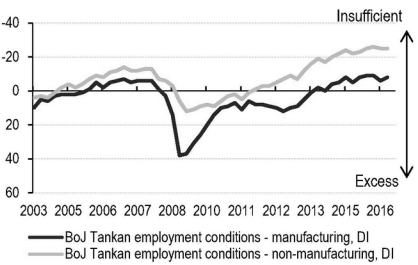
For these reasons, we think that the impulse of capital expenditures will likely be higher in the non-manufacturing sector, where capacity utilization rates are higher, and labor shortages (and hence wage pressures) are more acute (Chart 15 and Chart 16).

Chart 15: Capacity utilization rates by sector



Source: BofA Merrill Lynch Global Research, BoJ

Chart 16: Labor shortages by sector



Source: BofA Merrill Lynch Global Research, BoJ

Chart 17 shows the ratio of personnel costs to sales, using MoF corporate survey data. The ratio is particularly high for lodging & accommodations (23%), eating & drinking services (27%), medical, healthcare & welfare (37%) and education & learning support (37%). Somewhat surprisingly, personnel expenses are fairly restrained in retail. But this is partly due to the relatively heavy reliance on lower-cost part-time workers. Given the rapid growth in part-timers' wages, such cost savings is likely to become increasingly difficult to maintain.

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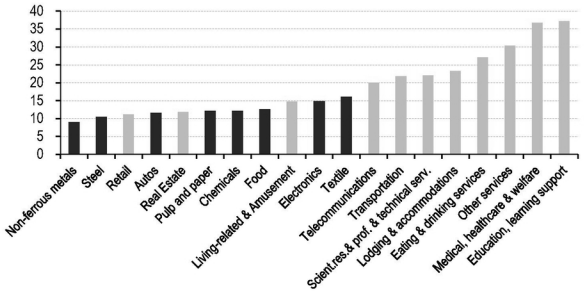
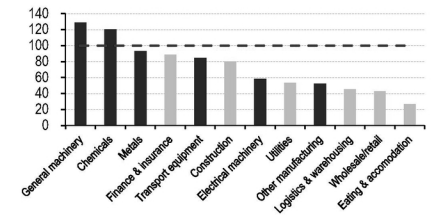
Chart 17: Personnel costs to sales, % ratio 4qtr ma (as of Apr-Jun 2016)



Source: BofA Merrill Lynch Global Research, MoF

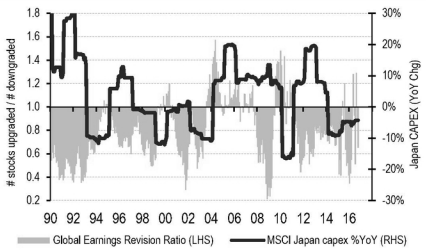
Analysis by METI suggests that many of these non-manufacturing industries have the scope to raise productivity. Wholesale/retail, utilities, and eating & accommodation have particularly low levels of productivity relative to the US (Chart 18). We think the solution is to boost capex, especially in ICT and automation. More broadly, an acceleration in capex is needed if we are to see a pick-up in productivity and sustained profits. Though we are by no means in the late stages of the profit cycle, the trend clearly points to higher wage costs going forward, requiring proactive efficiency-enhancing investment by corporates. Bottom-up data capex data for MSCI Japan also suggest that the investment cycle has troughed and will pick up next year as earnings momentum improves (Chart 19).

Chart 18: Japan's labor productivity relative to the US: services is low (2003-07)



Source: BofA Merrill Lynch Global Research, METI

Chart 19: Capex – YoY change in Japan vs Global Earnings Revisions



Source: BofA Merrill Lynch Global Quantitative Strategy

3. Policy priorities and redistribution

We think an increase in government pressure on corporations could speed up income redistribution at the margin, ensuring that money circulates to those sectors and agents with a higher propensity to consume. Elevated corporate savings remain a focal point for the government. Cabinet Office officials have used the concept of the "cash-out ratio"[3] to highlight the creaky transmission from corporate profits to spending. Chart 20

[3] The idea of the "cash-out" ratio was first raised by private sector representatives of the Council on Fiscal and Economic Policy. The measure is defined as cash out / cash and deposits. The numerator includes capex, personnel expenses, R&D, dividends, and changes in equity investments in related companies. The denominator includes cash and deposits, and securities, short-term lending, and investment securities classified under liquid assets. Since we are restricted to Ministry of Finance Corporate survey data, our version of the "cash-out ratio" is defined as capex + personnel costs + dividends / cash and liquid assets.

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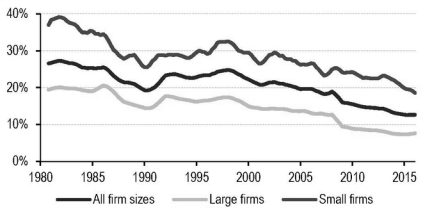
shows that this measure has been on a steady downtrend, with the numbers particularly low for large corporates.

So far, the government's approach has relied more on carrots than sticks, with Prime Minister Abe using a combination of moral suasion and sweeteners to encourage firms to disgorge profits. The pattern has continued as we approach FY2017. For example, local media have reported that the government is considering offering corporate tax breaks to SMEs that raise wages, in light of more modest wage growth at SMEs. Discussions are also underway in the Prime Minister's office about reforming working practices with the immediate focus on "Equal Pay for Equal work (EPEW)"—i.e. reducing the wage gap between regular and non-regular employees.

But the issue is contentious from both a capital and labour perspective. And considering the time it will likely take for related legislation to pass in the Diet, we think the lack of compliance mechanisms may mean that the immediate impact of EPEW will be limited. Instead, the debate seems to have shifted towards limiting excessive and unproductive overtime work. This is low-hanging fruit that does not address the issue of Japan's labour market rigidities, which are at the heart of the problem of suppressed wages and weak household spending power.

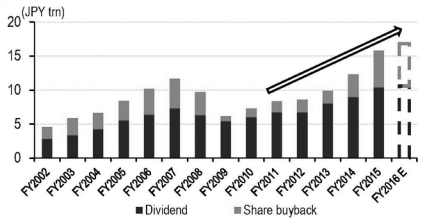
That said, there are signs that the government's patience is wearing thin and that the Prime Minister is increasingly leaning towards direct intervention. For example, the government has already delivered a minimum wage hike in FY2016 and plans to take the national average up to JPY1,000 by 2020 via yearly hikes of 3%. These policy changes should offer small tailwinds for the recovery in private consumption. We also think the debate over a possible retained earnings tax is unlikely to go away. We are sceptical it will be introduced in this year's tax reforms. However, the government's escalating war on corporates hoarding cash is likely to lead to a continued rise in dividend payouts and share buybacks (Chart 21).

Chart 20: Firms' cash-out ratio*, % 4qtr ma



Source: BofA Merrill Lynch Global Research, MoF *The cash-out ratio is defined as personnel expenses, capex, and dividend payouts as a share of cash and liquid asset balances

Chart 21: Dividends and share buybacks by Japanese firms (TSE 1st section listed)



Source: Nikkei Astra, BofA Merrill Lynch Global Research
Note: FY2016 dividend is companies' guidance. FY2016 share buyback is estimated by annualizing the YTD numbers as of November 2016

Risk factors: largely from overseas

A key risk to our 2017 outlook on the domestic side may be weaker-than-expected growth in real labor income, or a continued surge in the household saving rate, which would constrain consumption.

However, we think the biggest risks in either direction stem from abroad. Specifically, we see higher uncertainty over global trade, risk sentiment, and FX as a result of political transitions in the US and Eurozone. We consider multiple policy scenarios under a Trump presidency.

Trump's campaign promises have mixed implications for Japan. On a positive note deregulation, tax cuts, and aggressive infrastructure spending could boost US aggregate

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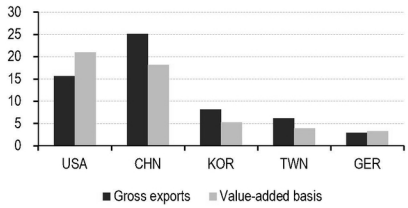
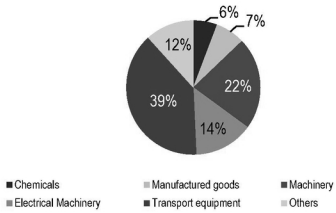
demand. Our US economics team expects the stimulus to boost growth in H2 CY17 and likely CY18. Japan should be a big winner from stronger US growth, given its high exposure to the US economy in terms of exports and corporate profits (Chart 22 and Chart 23). On the negative side, aggressive protectionist trade measures, if implemented, would depress US growth and global trade further. If combined with a stronger yen, Japan's economy would be hit hard.

Chart 22: Japan's export exposure (% of total gross and value-added exports*)



Source: OECD

Chart 23: Breakdown of Japan exports to US by commodity, 2015



Source: BofA Merrill Lynch Global Research, MoF

Base case: "benign Trump" scenario

For the moment, we are assuming limited positive and negative policy changes. Our US team expects uncertainty to cause a modest slowing of growth in the first half of next year, but this will be more than offset by fiscal stimulus in the second half and into 2018. But the size of the fiscal expansion will likely be smaller than promised, and the introduction of modest protectionist measures means that the boost to global trade will essentially be zero. Table 1 shows the impact on growth under two scenarios, based on different assumptions for global trade and FX. Under the upside case, Japan's GDP could rebound towards 2%, as the economy benefits from a combination of stronger global trade and a weak currency. Under a downside "protectionist" scenario, 2017 growth would slow to around zero and would most likely tip Japan back into deflation.

Table 1: Sensitivity of Japan's growth to global trade and foreign exchange rate

(Assumptions)	Baseline		Case 1 - Upside		Case 2 - Downside	
Global trade	0.0%		3.0%		-10.0%	
% JPY appreciation (*)	-7.0%		-10.0%		10.0%	
(Simulation results)	**Change**	**(Contribution) (**)**	**Change**	**(Contribution) (**)**	**Change**	**(Contribution) (**)**
Real GDP impact	0.2ppt	—	0.9ppt	—	-1.4ppt	—
Consumption	0.0%	(0.02ppt)	0.3%	(0.15ppt)	-0.8%	(-0.44ppt)
Capex	1.9%	(0.26ppt)	2.9%	(0.40ppt)	-3.2%	(-0.44ppt)
Net Exports	—	(0.00ppt)	—	(0.30ppt)	—	(-0.23ppt)

Source: BofA Merrill Lynch Global Research, CAO, MoF, IMF

(*) Rate of appreciation of Japanese yen in terms of effective exchange rate

(**) Contributions to the change in real GDP

Political impact of a Trump administration

For Japan, the impact of Trump's election goes beyond economic issues. It also impacts defense spending and regional trade arrangements.

Military self-reliance and budget choices

Trump has made it clear that he wants allies of the US to shoulder a greater share of the defense burden. There is a lot of uncertainty as to how far Trump will go to re-define the US-Japan alliance. Despite his criticism, Japan already pays about 75% of US military hosting costs. However, it seems fair to assume that Japan will be expected to

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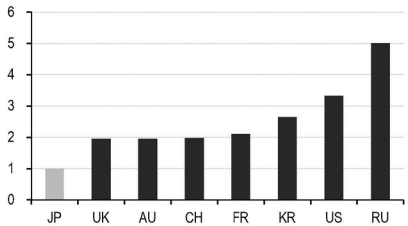
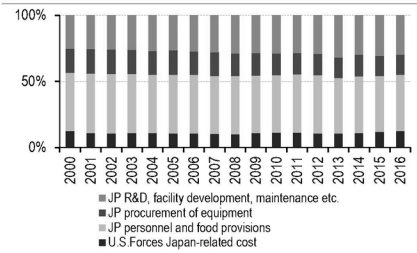
increase its defense spending. Under Prime Minister Abe, the defense budget has expanded by 7% but has been kept at roughly 1% of GDP, in keeping with historical guidelines. This is small by international standards and more likely than not will rise in the coming years (Chart 24). The composition of spending is also likely to shift from operating costs towards procurement, which is currently a very small part of the budget (Chart 25).

Chart 24: Military spending % of GDP as of 2015—Japan's is low by int'l standards



Source: BofA Merrill Lynch Global Research, World Bank

Chart 25: Breakdown of Japan's defense-related expenditures



Source: BofA Merrill Lynch Global Research, Ministry of Defense

TPP and trade policy: potential for linkages with other regional players

Trump and his aides have made it clear that they consider the Trans Pacific Partnership (TPP) to be a "bad deal." Media have reported that President Obama is not considering pushing the deal through a lame duck Congress. This means the deal is likely dead in its current form.

While negative for Japan, the expected withdrawal of the US from TPP could spur new arrangements with regional partners. One potential positive is the prospect of improved economic and trade linkages with other key players in the region, including Russia and even China. Three upcoming events are worth monitoring closely (Table 2): first, the 19-20 November APEC Summit in Lima, Peru, where we are likely to see vigorous discussions on the future of the TPP as well as further progress on the Regional Comprehensive Economic Partnership (RCEP); second, the 15 December Abe-Putin Summit, in Yamaguchi prefecture; and third a potential trilateral summit between Japan, China, and Korea, which onshore media now say is being scheduled for 19-20 December, though it may not happen given the unfolding leadership upheaval in Korea.

Bullish bottom line – don't underestimate the recovery

We are optimistic on Japan and think the acceleration in GDP and inflation in 2017 will be much stronger than consensus expects. For the first time since 2013, fiscal and monetary policy will be lined up in the same expansionary direction. The global export cycle has turned and is now tracking modest expansion. Meanwhile, the headwinds to domestic demand are finally turning into tailwinds. Unlike in the past, we think the risks of a policy error are low. Assuming that external risks are kept at bay, we think Japan will surprise with the strength of its recovery.

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Table 2: Calendar of political events

Date	Event
2016	
Sep 26 - Nov 30 (to be extended)	Extraordinary Diet session (supplementary budget, TPP, tax-hike delay, casino bill)
Nov 15	Japan-Russia trade officials meet (Tokyo)
Nov 17	Abe, Trump meet in New York
Nov 19-20	Abe, Putin meet at APEC (progress on territorial issue a key public concern)
Dec 8	Jul-Sep GDP 2nd preliminary (change to 2008SNA) Outline of FY2017 Tax Reform to be released
Dec 15-16	Russia's Putin to visit Abe in Yamaguchi prefecture
Dec 24	Cabinet to compile FY17 budget
2017	Ordinary Diet session (Jan) LDP annual convention (Mar 5) Tokyo parliamentary election (summer)
2018 and later	
2018	Governor Kuroda's term ends (Apr) Abe's second term as LDP President ends (Sep) Lower House election if no snap election before (Dec)
2019	Nationwide local elections (spring) Upper house election (summer) Consumption tax hike (Oct)
2020	Tokyo Olympics
2021	LDP Presidential term ends

Source: BofA Merrill Lynch Global Research

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Table 3: Economic forecast summary

		Calendar Year				Fiscal Year				Quarterly						
		2015 (A)	2016 (F)	2017 (F)	2018 (F)	2015 (A)	2016 (F)	2017 (F)	2018 (F)	3Q16 (A)	4Q16 (F)	1Q17 (F)	2Q17 (F)	3Q17 (F)	4Q17 (F)	1Q18 (F)
Real GDP	(%,qoq ann.)	0.6	0.7	1.4	1.2	0.9	1.1	1.4	1.2	2.2	0.3	2.1	1.5	1.0	2.4	-0.1
Private Consumption	(%,qoq ann.)	-1.2	0.4	1.0	1.2	-0.1	0.6	1.1	1.3	0.2	1.0	1.2	1.0	1.4	1.4	0.8
Private Capex	(%,qoq ann.)	1.6	0.6	1.7	3.2	2.1	0.7	2.4	2.9	0.1	5.0	-0.8	1.4	2.5	7.0	3.1
Private Resid. Investment	(%,qoq ann.)	-2.5	5.3	0.3	1.1	2.4	6.4	-1.3	1.7	9.6	-2.0	-2.0	-3.9	-5.9	6.1	1.6
Government Consumption	(%,qoq ann.)	1.2	1.6	0.8	1.0	1.6	1.1	0.9	1.1	1.7	0.8	0.6	1.2	0.8	0.8	0.8
Public Investment	(%,qoq ann.)	-2.5	-1.5	3.1	-2.1	-2.7	0.9	1.4	-0.7	-2.7	1.6	8.2	14.8	-11.5	-7.8	-3.9
Exports of Goods & Services	(%,qoq ann.)	2.8	-0.3	5.3	3.1	0.4	0.9	5.8	2.3	8.1	4.5	4.5	5.9	11.0	4.6	-3.0
Imports of Goods & Services	(%,qoq ann.)	0.4	-1.3	3.9	1.8	0.0	-0.4	4.3	1.4	-2.4	9.0	2.0	4.6	11.8	-1.9	-1.6
Contribution points																
Domestic Demand	(%,yoy)	0.2	0.5	1.2	0.9	0.8	0.8	1.1	1.0	0.2	1.1	1.7	1.2	1.1	1.3	0.2
Net Exports	(%,yoy)	0.4	0.2	0.3	0.2	0.1	0.2	0.3	0.2	2.0	-0.8	0.4	0.2	-0.1	1.1	-0.3
Industrial Production	(%,qoq)									1.4	0.7	-0.6	1.6	2.5	1.4	-0.9
	(%,yoy)	-1.2	-0.8	3.5	3.6	-1.4	0.4	4.2	3.0	0.4	1.2	1.7	3.1	4.2	4.9	4.6
Nationwide BOJ-style Core CPI	(%,yoy)	0.5	-0.3	1.0	1.4	0.0	-0.1	1.2	1.4	-0.5	-0.1	0.7	0.7	1.3	1.4	1.4
Nationwide US-style Core CPI	(%,yoy)	1.0	0.4	0.4	1.1	0.6	0.3	0.6	1.3	0.2	0.1	0.2	0.2	0.5	0.7	0.9
Unemployment Rate	(%)	3.4	3.1	2.9	2.7	3.3	3.1	2.8	2.6	3.1	3.0	3.0	2.9	2.9	2.8	2.8
BoJ ST interest rate target	(End of period)	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
BoJ LT interest rate target	(End of period)	n/a	0.0	0.0	0.0	n/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yen/$	(End of period)	120.2	108.0	120.0	115.0	112.6	112.0	115.0	115.0	101.4	108.0	112.0	115.0	117.0	120.0	115.0
Yen/Euro	(End of period)	130.6	116.6	126.0	121.0	128.1	117.6	124.0	121.0	113.9	116.6	117.6	117.3	119.3	126.0	124.0

Note: We may revise our forecasts once additional data become available.

Sources: BoJ, MoF, ESRI of Cabinet Office(EPA), MPMHAPT(MCA), METI(MITI), Ministry of Land, Infrastructure and Transport and BofA Merrill Lynch Global Research estimates.

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USD/JPY: Buy-on-dip cycle to continue; 115-120 by end-2017

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Buy-on-dip cycle continues

While we had acknowledged the risk of the "final JPY strength" this autumn on the BoJ's limit and US elections, it has been our view that the USD/JPY's dips was to be bought as the 100-105 level was where medium-term directional risk was likely to reverse to the upside (Dollar's 100 Yen risk 02 March 2016). In our view, a Republican sweep would first lead to JPY strength on risk aversion, but eventually be the most bullish outcome for the USD/JPY. The price action last week – a shallow dip – tells us two things about the USD/JPY. First, the view that a GOP sweep would boost the USD/JPY was probably more widely shared than we had thought, so a dip failed to stretch. Second, there may be more potential USD/JPY buyers than sellers, which is in stark contrast to last year, when there were many more potential USD/JPY sellers than buyers (Case for a stronger yen in 2016 18 December 2015). The "buy-on-dip" cycle in USD/JPY is likely to continue as we expect the pair to reach 115-120 by end-2017. We remain constructive about Japanese equities and see banks, insurance continue outperforming REITs near-term.

Higher US rates (esp. if steepening) to boost USD/JPY

USD/JPY performs best at the time of UST bear-steepening as better risk sentiment reduces the JPY's safe haven demand and a wider yield spread increases the USD demand from Japanese investors (Exhibit 2). For our US strategists, the clean sweep means fiscal easing and higher rates, supporting their higher real rate view (A win for bond bears and USD bulls 09 November 2016). The USD/JPY has recently tracked real yield spread closely (Chart 1), and the pair is gradually producing higher carry as monetary policy is diverging between the US and Japan (Chart 2). In Japan, fiscal easing is also a possibility in light of reduced odds of TPP implementation and a potential early snap election. Any positive impact of Japanese fiscal easing on growth is likely to manifest itself in higher inflation expectations under the BoJ's yield-targeting regime, which means Japanese real interest rates can actually fall.

Watch Abe-Trump meeting – coordination or conflict?

Given the high uncertainty, clarifications on Trump's policies on trade and currency will be important for the Japanese market going forward. A potential Abe-Trump meeting in New York this Thursday (17 Nov), as reported by Japanese media, warrants attention. We suggested that Trump presidency could potentially reduce flexibility of Abe's political and diplomatic strategy, reduce positive market risk from Japanese politics, and increase negative risk from Japan's national security. But this is not known until we see actual Trump presidency. If the President-elect shows an understanding for the existing Japan-US alliance and refrains from protectionist rhetoric, it could reduce concerns about deterioration of the bilateral relationship, supporting USD/JPY and potentially exporter shares (though reduced odds of TPP implementation is unlikely to change drastically).

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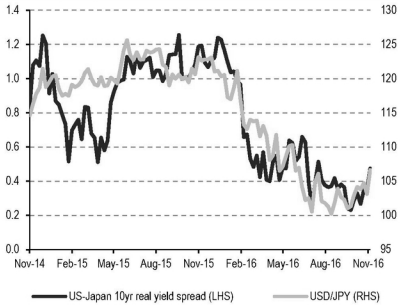
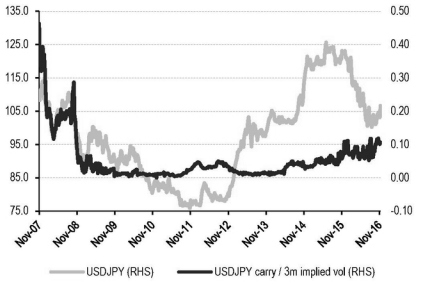
Timestamp: 13 November 2016 06:10PM EST

Chart 1: USDJPY vs yield spread



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 2: USDJPY carry* gradually inching up

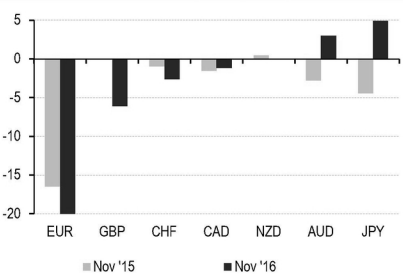


Source: BofA Merrill Lynch Global Research, Bloomberg
*Using 3m deposit rate

JPY sellers > JPY buyers

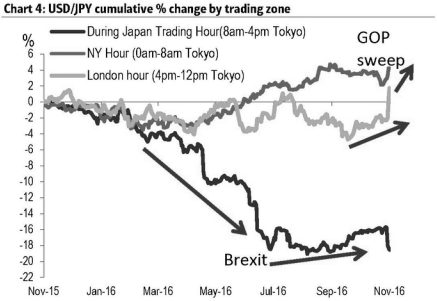
While uncertainty is high, what is more certain is that there are more potential sellers of JPY than its buyers. This is the opposite of the situation some months ago (USD/JPY's downside risk to 110 – sell on rally 10 February 2016). First, CFTC speculative position remains yen long though short-term traders are probably positioned for the upside already (Chart 3). Second, we believe domestic activity to raise hedge ratio has run its course as the USD/JPY swept through the sensitive level this year. As 2HFY16 (Oct '16-Mar '17) has started, most life insurance companies are reportedly inclined to increase exposure to unhedged foreign bonds though they generally remain price sensitive. In our view, this is reflected in the USD/JPY's consolidation during Tokyo trading hours after the pair hit 100 on the Brexit vote (Chart 4). The fact that USD/JPY has failed to break 100 multiple times since then suggests the market looking for USD/JPY's dip, light positioning, and the market's judgment that USD should be more expensive than 100 JPY. The market is probably more vulnerable to the USD/JPY's upside than downside.

Chart 3: CFTC non-commercial futures position (bln USD)



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 4: USD/JPY cumulative % change by trading zone



Source: BofA Merrill Lynch Global Research, Bloomberg

Technical: constructive

Daily overbought momentum (RSI) is overall a positive for USD/JPY's uptrend. Overbought conditions can persist longer in uptrends, but at some point this could

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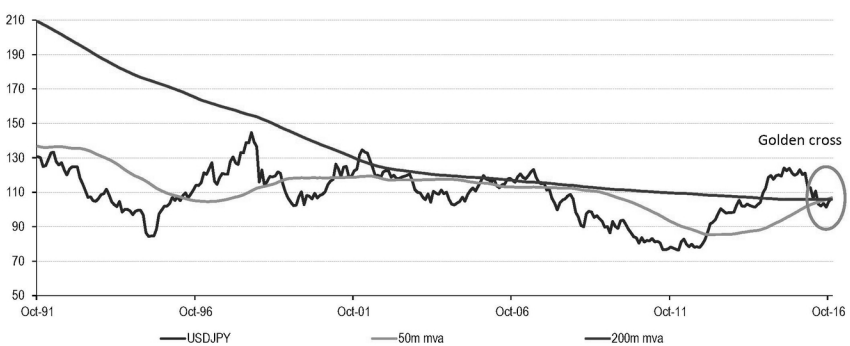
reverse. Fading high 106's could be a short-term profit-taking view, or area to enter countertrend short. A final thrust toward July highs of 107.49 is possible and an alternative profit-taking level. A pullback to 105.50 or 104.30 could certainly be bought for the broader uptrend targets of 108.47, and possibly 111.40, from the weekly chart pictured here.

Exhibit 1: USD/JPY weekly chart

Source: BofA Merrill Lynch Global Research, Bloomberg

Long-term picture: 50m average crossing 200m average

Chart 5: USD/JPY monthly chart with 50m average and 200m average



Source: BofA Merrill Lynch Global Research, Bloomberg

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Higher yields leading to bank, insurance outperformance over REITs

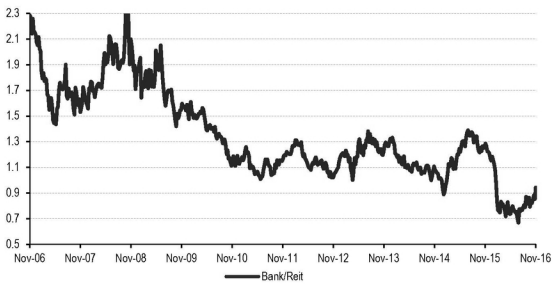
The Japanese equity market correction managed to last just for one day after the US election. The insurance sector has been the best performer since the US election on the back of a steeper US Treasury curve and higher rates. Michael Hartnett observes "violent rotation out of deflation to inflation plays", including a move from REITs to US banks. This should apply to Japan, where banks and insurance have underperformed REITs amid relentless fall of the long-term yield and introduction of negative interest rate by the BoJ (Chart 5). The domestic policy condition has changed, however, as the BoJ is now reluctant to cut rate as it pays greater attention to the health of the financial institution. The BoJ now intends to prevent the yield curve from flattening excessively. While higher foreign yields may not lift yen rates as the BoJ controls the 10-year sector, reflationary environment outside Japan at least reduces the risk of a deeper cut at home. Outperformance of Japanese equities at the time of UST bear steepening has historically been led by cyclicals, banks and insurance (Exhibit 2). David Gleeson is cautious about REITs, while Futoshi Sasaki is constructive on banks. The move can stretch further near-term.

Exhibit 2: US Treasury curve (2s10s) move and market performance (past 43 quarters simple average, %) – USD/JPY, Japan equity (local ccy term), and Japanese cyclical, bank, insurance tend to outperform at the time of UST bear-steepening

	USDJPY	Dollar index (DXY)	MSCI Japan	MSCI Japan / ex Japan*	Japan sector*									
					Discretionary	Financials	Materials	IT	Industrials	Energy	Telecom	Staples	Utilities	Health care
Bear steep	4.12	-0.60	8.58	3.32	11.68	9.97	9.96	9.46	8.58	5.88	3.27	2.86	2.83	1.89
Bear flat	1.90	0.31	3.88	0.58	3.49	-0.44	5.44	4.09	3.88	4.26	3.66	2.34	-0.06	5.21
Bull steep	-1.85	-0.35	-2.32	-2.76	-3.03	-2.44	-4.70	-4.22	-2.32	-3.46	2.44	1.44	-3.64	-0.47
Bull flat	-4.49	1.26	-7.31	-5.05	-8.91	-11.10	-9.94	-8.23	-7.31	-9.61	-0.37	-1.50	-4.16	-1.59

Source: BofA Merrill Lynch Global Research, Bloomberg
Used Bloomberg Treasury yield index.
Curve movements defined based on 2yr move (up or down) and 2s10s move (up or down) so these include twist movements, but even if we exclude these, implications for USDJPY and Japan equity do not change significantly.
11 quarters of bear steepening = average 16bps increase in 2yr yields and 33bps 2s10s steepening; 10 quarters of bear flattening = average 26bps increase in 2yr yields and 20bps 2s10s flattening; 10 quarters of bull steepening = average 48bps decline in 2yr yields and 28bps 2s10s steepening; 12 quarters of bull flattening = average 27bps decline in 2yr yields and 30bps 2s10s flattening
Japan / ex-Japan = MSCI Japan / MSCI Kokusai ratio
Japanese sectors follow MSCI definition

Chart 6: If inflation, rates surprise to upside, Japanese banks likely to outperform REITs



Source: BofA Merrill Lynch Global Research, Bloomberg

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3 risks – reality vs hope, higher yields, politics

The biggest risk to our view is that actual US fiscal easing turns out to be minimal. But we believe the USD/JPY's move will be quicker than whatever reality emerges in coming months. China's unexpected RMB devaluation or any explicit rhetoric to guide USD weakness by the new US administration could eventually trigger significant JPY strength. The other risk is a rapid increase in US long-term yields triggers risk-off trade, supporting Japanese yen. However, we believe a potential correction in US equity is unlikely to reverse the medium-term direction of USD/JPY (though it could cause a short-term pullback as our technical analysis suggests) because higher yields and USD/JPY are backed by fundamentals for now –prospect for fiscal easing. Finally, politics is a significant concern. The President-elect has previously criticized the Japan-US security alliance. A shift away from the Japan-US security alliance could lead to higher geopolitical risk for Japan. It could also lead to more defense spending and expansion of Japanese military capability and could lift prospect for fiscal expansion. A combination of higher geopolitical risk and defense spending is probably less bearish USD/JPY than Japanese equities.

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Global Cross Asset Strategy – Year Ahead

The Trump inflection

Bank of America Merrill Lynch

Investment Strategy

30 November 2016 Corrected

Investment strategy
Global

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Key takeaways

- Market response to Trump is logical but moves have been frontloaded. We now see USD & rates only modestly higher next year.
- We see higher growth and inflation, notably in Japan. **We go long NKY**, stay long EM AXJ & selective yield in equity/ credit.
- Risk is an overshoot so we stay long USD/ short rates, adding a CNH put and short 10Y real rates. CNH a hedge vs trade risk.

Trump extends some trends, starts others

In the three weeks since Donald Trump's election victory global markets have seen some dramatic moves. Som1e of those moves are extending trends that had already started – higher yields, higher USD, rotation from long to short duration. Others are new – JPY lower, NKY higher, EM lower. The key question is how much more they can go?

Growth/inflation higher in 17/18 - modest fiscal boost

Our economists think the fiscal impact of Trump will be modest at 0.5% on growth in H2 next year. Fiscal stimulus elsewhere also to be modest but it is taking the pressure off monetary policy. Growth was already improving so any fiscal stimulus helps. Our economists have both growth and inflation higher into 2017 and 2018.

Inflection point in markets but much discounted already

Market moves at turning points are often violent. The task of investors is to work out how much is already discounted. Our fixed income strategists have 10Y US yields at 2.65bp and bunds at 65bp at end 2017, also EUR/USD at 1.02 so moves look frontloaded to us. That suggests their implications for other markets should fade.

Evolution not revolution – long NKY, short 10Y real rates

If that is the case then we do not want to make wholesale changes to our strategy. We make two key changes today, adding long NKY (Japan strategist targets 20k) and short 10Y real rates trades. The former is part of our strategy to be pro-growth and we think it complements our long EM Asia trade being affected differently by USD strength.

The hunt for yield is dead, long live the hunt for yield

If yields only rise modestly next year then the hunt for yield will live on. We keep a yield basket in European equities, AT1s and spread in Euro/US credit. We go outright long European Healthcare by lifting our Food & Beverage short, which has dropped sharply.

Overshoot in rates, USD and trade key risks – add CNH put

The world would look very different if the US 10Y blew through 3% and the USD went on a tear, so we stay long USD and short rates. We add a CNH put vs USD as a hedge against an escalation of trade tensions under the new Trump administration.

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Timestamp: 30 November 2016 12:00AM EST

Current trade recommendations

Table 1: Current cross asset trades

Asset	Trade idea	Strategist
Equities	Long European Quality Yield Screen (yield)	James Barty
	Long SXDP Index	**Ronan Carr**
	Long Nikkei	**Shusuke Yamada**
	Long European index dividend futures	James Barty
	Long MSCI Asia ex-Japan	Ajay Kapur
Equity vol	Long RTY short SPX 2y variance swap	Nitin Saksena
	3000-2850 SX5E put spread Dec 16 expiry	James Barty
	Long NKY short SPX Dec 18 variance swap	Benjamin Bowler
	Long SX5E short SPX Dec 18 variance spread	Abhinandan Deb
	Eurostoxx 2y/3y put calendar	Abhinandan Deb
FX	Short EUR/SEK	Kamal Sharma
	Long USD/CNY call	**Claudio Piron**
	Short GBP/USD	Kamal Sharma
	Long USD/AUD	Ian Gordon
	Long RUB/ZAR	David Hauner
Fixed Income	2s-5s-10s fly	Shyam S.Rajan
	Short US 10y real rates	**Shyam S.Rajan**
	Paying 5y GBP real rate swap	Mark Capleton
Credit	Buy 30y US IG Industrial spreads	Hans Mikkelsen
	Buy basket of Euro AT1s	Barnaby Martin
	Long Xover short Main	Ioannis Angelakis

Source: BofA Merrill Lynch Global Research. For the full methodology and reference pricing please see Appendices. **New trades in bold**.

Themes

Long Cyclicality

- Long Asia EM – recovering growth, earnings revisions and cheap valuation.
- Long Nikkei – growth picking up, JPY soft, 20k target.

Long Yield

- Long European dividend yield stocks – 5% yield, big pick up over IG credit.
- Long Dec 18 SX5E dividend future – implies 4% drop from 2016, we see 4% rise.
- Long basket of AT1s – high yield, equity cushion to rise.
- Long XOver short Main – investors' reach for yield to push them towards Crossover.
- Long basket of 30Y US industrial IG spreads – further spread compression.

Hedge the Fed/Trump

- 2-5-10 fly – 5Y part of the curve looks most vulnerable to Fed hiking.
- Short 10Y real yields – inflation breakevens have adjusted real rates have not.
- Long USD – long via USD/GBP and USD/AUD, we think policy divergence will drive USD stronger if the Fed tightens as our economists expect.
- Long USD/CNH 7.6 6 month call – hedge against trade tensions

Hedge the Rest

- We are long SX5E, NKY and RTY vs SPX variance. Carry positive, convex in a sell-off.
- Long Dec 17/18 SX5E put spread. Long 3000-2850 Dec 16 put spread.

Alpha Trades

- Long European Pharma. Sector discounting no pipeline, valuation back to cheapest since 2011. Solid yield too.
- Paying 5y UK real rates at -254bp. Implied inflation/rates inconsistent.
- Long RUB/ZAR (positive on oil, cautious on S African politics).
- Short EUR/SEK, strong Swedish growth, limiting room for Riksbank easing.

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The Trump inflection

Changes today: Add NKY long, 10Y real rate short and CNH put, close forward Kospi vol and Food & Beverage short. We are not making mass changes today. While some of our trades have worked better than others post-election we are broadly happy with the balance. We still want exposure to growth and to own yield where we can but also want to protect ourselves from a further surge in the USD and rates.

We diversify our equity long in EM and European yield with a long Nikkei position. It is not the best entry point but we suspect it has further to run on a one year horizon. A stronger USD is good for Japanese equities where it is not for EM, so they complement one another. **We add a short US 10Y real rate trade** too to protect against rising US yields, as breakevens have already moved significantly. We **close our Kospi vol trade** (changed view from strategists) and **drop the short Food leg of our Pharma/Food trade**, reflecting the sharp sell-off in the long duration sectors of late.

Summary: Still be long growth and yield but hedge with USD and Rates
Year aheads are notoriously tricky to write and almost always wrong. Anyone who wanted to correctly predict the outcomes and how markets would react to them in 2016 did not need so much as crystal ball as a time machine. As investors and strategists we have to make calculations as to the most likely outcomes, where is the best upside to play them and how best to hedge the risks around them.

Donald Trump's election is in our view an inflection point for global markets, starting new trends in some asset classes and extending trends in others. It does not completely change the world though, as the disinflationary and weak growth pressures that have plagued the world since the GFC are structural rather than cyclical. But the shift to fiscal and populism is likely to boost growth and inflation, so it does change the picture to a significant degree. If we are to call it an earthquake it is perhaps a five rather than a nine on the Richter scale.

We have to adjust our way of thinking though. **The rise in rates and higher USD that we had hedged against now look like they are going to go further.** That is going to hurt longer duration assets. So we continue to run our long USD positions and add to our short rate positions (via 10Y real rates). There is risk around trade and geopolitics, which has to make us more nervous of our EM positions. So we diversify our risks by **pairing our long EM position with a long Japan position and add a CNH put**.

But the world is not completely changing. Even in the new order we only forecast 10Y Treasuries at 2.65% and Bund yields at 65bp end 2017. **So the hunt for yield will not disappear completely.** We still want to own yield, but as we have said of late it cannot be yield for yield's sake. Yield in equity markets has been safest in the shortest duration buckets, such as Banks and Cyclicals since the summer. We changed our yield basket last month is this direction so we keep it. We stay long AT1's and in credit we keep our spread trades both in Europe and the US.

AND we remind investors of something we said at the start of 2016, be prepared to trade the ranges in markets. If there was one lesson of the last year it was that. When assets get very loved and overbought, sell them, when it is the opposite you have to buy them. Think of buying EM and commodities in February. Think of selling defensive equities and bonds and buying banks post-Brexit. None of us will get that right all of the time, but the Warren Buffet maxim "be greedy when others are fearful and fearful when others are greedy" is particularly useful in current markets.

Finally, as cross asset investors **think about what can go wrong with your positions and find asymmetric hedges** for them if you can. That should be the edge you have at looking across the range of asset classes compared to single asset class investors.

We would like to thank our BofAML colleagues who have supported our product this year by providing many such ideas and trust they will continue to do so through 2017.

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X Asset Strategy: Long growth, short bonds, long USD but the hunt for yield lives on

Clearly markets are different and will continue to be so under President elect Trump BUT not everything will change. The disinflationary forces triggered by the GFC have not gone away but the decision to focus on fiscal stimulus, not just in the US but also Japan and to a lesser extent the UK, is a welcome shift taking some of the burden away from monetary policy. It means rates should be higher for any given amount of growth. But higher does not mean a return to pre GFC levels of rates, which we need to bear in mind when setting our strategy. Indeed, our strategists 10Y forecasts are US 2.65%, Euro 0.65% and Japan 0% for end 2017.

Similarly on trade, for all the rhetoric of the President-elect again we do not think he wants to trigger trade wars that would damage US growth. That means we should not necessarily drop our pro-EM bias.

So we think of it as an evolution rather than a revolution in the way our strategy is structured. We wanted to be exposed to growth, we tweak that by adding a NKY long to replace our US energy long. We continue to have yield in the portfolio where we can find it, which is through a mixture of equities and credit (AT1's, European yield basket, Xover v Main and US long date industrial spreads).

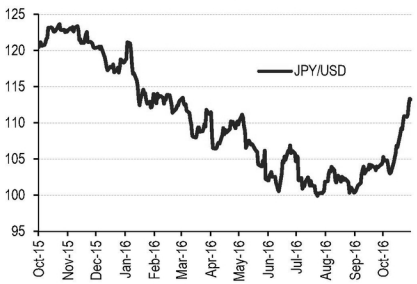
Even more than before we want to be protected against a stronger USD and higher rates, hence the addition of the 10Y real yield trade, and trade tensions which we have tried to cover through our CNH put.

Nov 8th accelerates some trends, starts other

Before the US election we said that the tectonic plates were starting to shift, with bond yields having troughed and starting to head higher. We thought there were signs too that global growth might be shifting up a gear. So we wanted to have defensive positions in bond markets, be long the USD and be long growth where we could. The election of Donald Trump has arguably turned this gradual shifting of plates into a full blown earthquake for global financial markets.

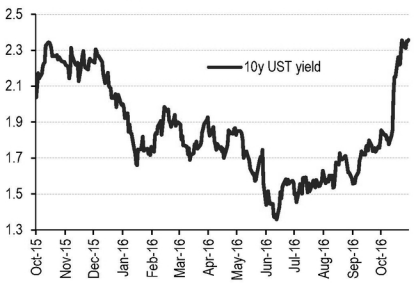
The key questions for investors as we look ahead to 2017 are how big an earthquake and how much the moves that have happened since November 8th are likely to be extended into next year vs how much we have frontloaded them already in 2016.

Chart 1: USD/JPY has surged post-Trump



Source: Bloomberg

Chart 2: As have bond yields



Source: Bloomberg

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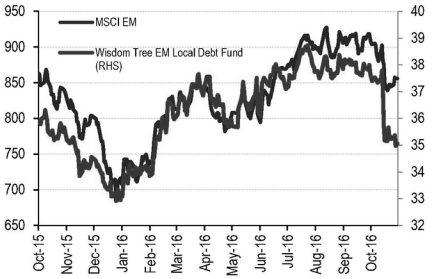
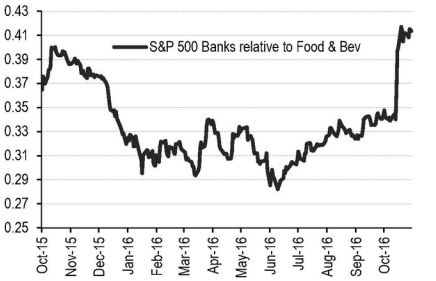
Chart 3: EM debt and equity have been hit



Source: Bloomberg

Chart 4: While Banks versus Staples has gone ballistic



Source: Bloomberg

The moves since Nov 8th have certainly been violent in certain asset classes. USD/JPY stands out, but the sell-off in US treasuries has been very marked, the hit to EM fixed income equally big, while in equity markets the outperformance of the Russell, the surge in the US banks and the sell-off in long duration equities has been remarkable.

Some of these moves, such as stronger USD, higher yields, banks vs staples were extensions of moves that had already begun. Others, such as Russell vs S&P, JPY, Nikkei, were the start of new moves where 8 Nov marked a key turning point.

The moves that had already started are now getting quite stretched with US 10Y yields up 5 standard deviations from the July low, with US Banks up by a similar amount vs Staples. The USD/JPY move though is more like a 2 SD move, with the NKY similar (if we exclude the 7% drop on US election day).

Peak liquidity, deflation, inequality and globalisation – watch for Peak Trump

So what does a Trump presidency mean for the world? Michael Hartnett, our Chief Investment Strategist sums it up nicely with four of his seven peaks. **Peak liquidity** – the era of excess liquidity is over; **Peak inequality** – with fiscal stimulus to address inequality; **Peak globalisation**- free movement of trade, labour and capital ending, FX wars starting; and **Peak deflation** – the secular low point in bond yields now behind us. We would add a peak to that which investors need to bear in mind – **Peak Trump**. What we mean by that is at what point do the policy changes of the Trump presidency get fully discounted in markets. We have moved pretty quickly to do that but we suspect there is more to go, even if the quick returns have probably already been made.

If we think about these peak questions, the two that stand out to use as obvious and not really open to challenge are Peak liquidity and Peak deflation. The Fed left its peak liquidity position behind ages ago, the BOJ has moved to yield rather than liquidity targeting, the BOE may extend its current programme of QE one more time but then is probably done and even the ECB is talking about tapering, even if they are unlikely to do it in December. The Peak deflation theme follows on from this with the secular low in bond yields surely behind us if the central banks are stepping away from flooding the world with ever more liquidity.

Peak liquidity/deflation means higher yields – inflation expectations adjusting

The question then is how much yields will likely rise from here. Much of course depends on how quickly inflation picks up. Markets have already moved to price in a significant pick-up in expected inflation as the two charts below show. To our mind breakeven inflation rates had been too low for too long, which is one reason we wanted to be defensive in bond markets. It would seem to us that inflation expectations are now up with events. US headline CPI at 2.5% is consistent with the Fed modestly overshooting

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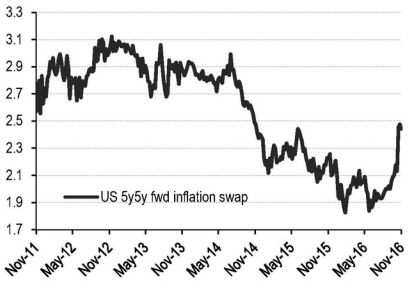
its 2% core PCE target. Our economists think that the Fed may well aim a little high in the short term on inflation to ensure they have sufficient room to ease in the event of a downturn. However, it is unlikely that the Fed would tolerate a sustained overshoot of their inflation objective. That is particularly the case if the Fed under President Trump is made more hawkish as our economists think it probably will be (see Liquid Insight: Trump's stamp on the FOMC).

Chart 5: US 5Y5Y forward inflation back towards 2.5%



Source: Bloomberg

Chart 6: Euro 5Y5Y forward inflation up to 1.6%

Source: Bloomberg

Equally, our economists in Europe are sceptical on the ECB's ability to get inflation to rise significantly from current levels. Optically there is scope for European breakevens to head higher if the ECB were to be successful but investors are likely to want to see some evidence of rising inflation first before they price that in. We will return to this below. For now we agree with our fixed income strategists that the rise in inflation expectations is probably sufficient and that any rise in yields from here has to be one of higher real yields.

They think such a rise as a tightening of monetary conditions which may be self-limiting in the short term, particularly as the fiscal boost in the US is likely to be back loaded in terms of 2017. If rates move too quickly and the USD follows before the fiscal stimulus kicks in they could actually dampen growth. Indeed, our US economists have shaved their near term growth forecasts already to reflect the current moves. They do not expect the fiscal stimulus to start to boost growth before the 3rd quarter.

Fiscal + hawkish Trump Fed means we stay short 5Y US via 2-5-10 butterfly

Our fixed income team estimated how much fair values of the different parts of the curve would have to move were the market to move into line with the dot plot. Updating those estimates for the move since their publication we find 2Y rates can move another 11bp, 5Y 39bp and 10Y 33bp. They argue that given we are past the inflection point for rates, with fiscal policy being eased and now with a more hawkish Fed under Trump likely, the dot plot should form the floor not the ceiling for rate expectations. All of this translates into a view that 10Y yields can push to 2.65% by the second half of 2017. Given their views on the curve we continue to run the 2-5-10 butterfly. It has moved from around -10bp to +10bp since the election, and our fixed income strategists have moved their target to +20bp.

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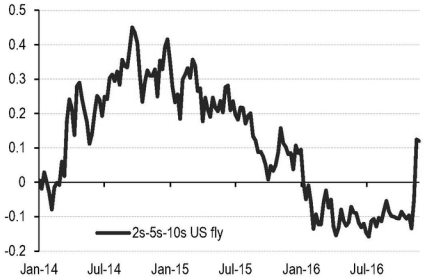
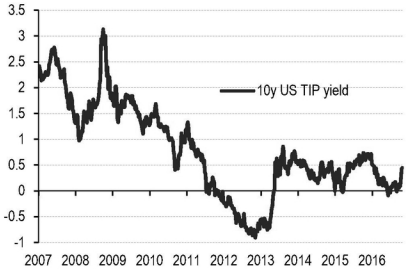
Chart 7: 5Y yields to continue to underperform



Source: Bloomberg

Chart 8: Real rates likely to feel the pressure going forward



Source: Bloomberg

Peak globalization/inequality means higher real rates – short 10Y US real rates

Our fixed income team make the point that globalization has been a driving force behind lower real rates as it has been good for EM growth and reserves. Those reserves then found their way back into the US holding real rates lower. They argue that as the global savings glut unwinds real rates have room to re-price. Peak inequality also means an unwind of globalization as politicians seek to protect workers from the depressing effect on wages coming from overseas. Donald Trump has already said he intends to charge China with being a currency manipulator. Whether he does or not and what action he takes to accompany it remains to be seen, but artificially low currencies generating high current account surpluses are unlikely to go down well with the new administration. That lends weight to the fixed income team's arguments.

Peak inequality may also mean less migration across the world – think Trump's arguments on illegal immigration from Mexico and Theresa May's desire to limit migration into the UK post Brexit. Less migration likely means more upward pressure on wages, which is the inflation expectations side of the argument. But Michael Hartnett also thinks it means more action on fiscal policy. The UK government have implemented a £24bn infrastructure fund in the Autumn statement. Donald Trump wants to trigger up to $1tn of infrastructure spending in the US in addition to the tax cuts.

The fiscal boost should push real rates higher (at least in the short term). Some Fed members have acknowledged this suggesting that equilibrium interest rate might be moved higher by fiscal stimulus. The rates team also rightly says while they want to be bearish rates given the speed of the move so far it is also right not to be foolish. Given how much inflation expectations have moved they think there is better risk reward in real rates. They argue the 10Y real rate is the most vulnerable to further moves higher in rates. Although they have already risen from around zero in the summer to ~50bp now they think 10Y real rates can reach 1%. So we add that trade to our 2-5-10s position.

Implications for other asset classes: Stronger USD, weaker EM?

The forces impacting on markets from the Trump victory have not been confined to rates markets, although it is probably fair to say that most (although certainly not all) of the impact stems from the move in rates. Higher US rates have meant a stronger USD, an outperformance of short duration over long duration equities, a hit to EM debt and all forms of carry trades.

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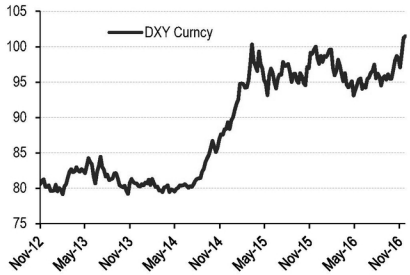
Chart 9: USD breaks to new highs



Source: Bloomberg

Chart 10: As Treasury yields open big gaps with Europe and Japan

Source: Bloomberg

The USD is a case in point, with the higher US rates creating a significant gap to equivalent Euro and JPY rates. With the ECB likely to extend QE by the full current amount (despite the debate over timing) and the BOJ committed to capping JGB yields at zero, a surge higher in the USD was the logical outcome. Given that the biggest gap in intentions was relative to Japan it is perhaps not surprising that the JPY has been the biggest victim, with the JPY falling some 10% against the USD since the election. The DXY has broken out of the top end of the trading range it has been in since early 2014.

The stronger USD is not just reliant on higher yields, but also other factors such as the likely repatriation of money into the US under a new proposal for US corporates to return funds at a concessionary tax rate, generally referred to as HIA2.

We had positioned long USD as well as short rates, not so much as an explicit play on a Trump victory but more against a more hawkish Fed in 2017. We were also of the view though that a Trump win would likely be positive for the USD and higher yields. Going back to our fixed income strategists' point that the dot plot should now perhaps be the base case for the markets that does imply higher yields which should continue to be dollar supportive. Like their bond yield forecasts though our strategists call for a modest further appreciation of the USD rather than a huge surge. They have the USD peaking at 1.02 vs the EUR, 120 against the JPY and 1.43 vs the CAD.

So the big violent move has likely happened even if we still see the USD strengthening further next year. Certainly our FX strategists are not calling for a surge in the USD similar to the one that happened in 2014/15.

The reaction of the US economy to "Trumponomics" is key

These two things are important for other asset classes. If we really thought 10Y Treasuries were heading to 3%, the Fed likely to tighten above the dot plot and the USD to surge another 10% in quick order, the impact on other asset classes would likely be more severe. That would undoubtedly exacerbate the trends we have seen out of EM and long duration equities. We also suspect it would make it much harder for commodities to perform. We see holding USD and short rates positions as necessary to hedge against such an outcome with limited downside risk if it does not happen.

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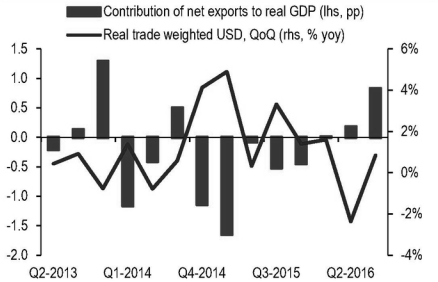
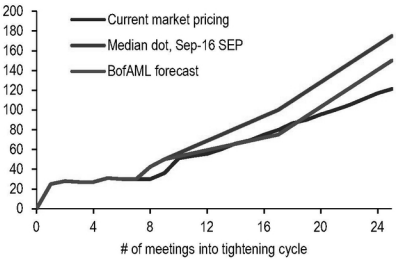
Chart 11: Dollar strength leads to immediate trade drag (inverse relationship)



Source: Federal Reserve Board, Bureau of Economic Analysis

Chart 12: Expected path of fed hiking cycle (bp)



Source: BofA Merrill Lynch Global Research, Federal Reserve, Bloomberg

Nevertheless it is not our central scenario in part because there is a risk that much of a Trump surge could be bad for growth. As we noted above the fiscal stimulus is likely to be back loaded as far as 2017 is concerned. In the meantime the FX and Rates teams predict an 8-10% appreciation of the USD from pre-election levels and 10Y rates about 80bp higher. Our economists note that a 10% appreciation of the USD is estimated to slice around 0.5% off of US GDP growth over two years. Higher mortgage rates from higher bond yields would also likely dampen growth. As a result, they have actually lowered their forecast for US growth in the first half of next year to around 1.5% before seeing it rebound to around 2.3% in H2 and then 2.5% in 2018 as the fiscal stimulus feeds through.

Various Fed members, notably Bill Dudley of the NY Fed, have said this year that a stronger USD would have an impact on monetary policy. So to some extent we see USD strength as self-limiting as it would start to lower the profile of likely Fed tightening.

Our economists are also cautious as to the extent of the impact of the Trump fiscal plans. Assuming that there is a compromise between the Trump administration and Congress our economists think the likely scale of tax cuts is $2-3tn over 10 years, with $200-300bn of this in 2017. Given the low estimated multiplier from any proposed tax cuts and a Congress likely to limit the amount of an increase in government spending, they look for a modest 0.5% boost to growth.

Upside risk to growth and rates if Trump does more on fiscal, less on trade

If Congress passes more of the Trump stimulus plan, particularly on the infrastructure side, and there are no significant changes to trade or immigration policies then our US economists think growth could potentially hit 3% in 2017 and 3.5% in 2018. That would likely be accompanied by a faster pace of Fed hikes than they currently assume (which is two hikes between now and end 2017 followed by 3 in 2018).

Trade policy and its impact vital

The other key factor of the new administration is going to be the direction on trade. President elect Trump has already said he will pull out of the TPP, TTIP looks likely to get the same treatment, while NAFTA is set to be renegotiated. Meantime Trump said he will label China a currency manipulator. This is the other side of the Peak Globalisation/Peak Inequality coin and none of it looks good for global trade. Combined with the stronger USD and higher rates, it is easy to understand the knee jerk reaction of investors to sell EM asset, particularly given the gains of earlier this year.

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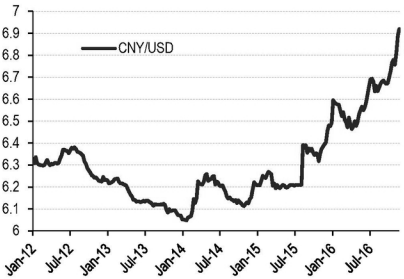
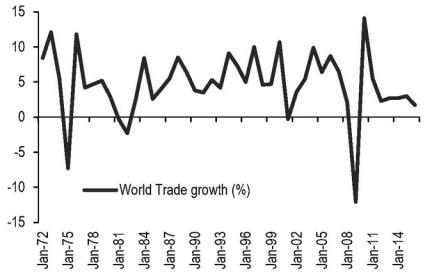
Chart 13: China could be named a currency manipulator



Source: Bloomberg

Chart 14: But world trade has slowed – would Trump make it worse?



Source: WTO, BofA Merrill Lynch Global Research

The question for investors is whether Trump the candidate or Trump the deal making businessman will eventually be the driver behind trade policy. It is not impossible to imagine the President-elect gaining some concessions from his hard line stance and then claiming victory. After all, since one of his aims is to get the US economy growing at 4% a year, a prosperous global economy to export into is probably preferable to one that is taking a hit from an aggressive US trade policy. That is the inclination of our EM strategists and economists, so they are expecting the reality to be softer than the rhetoric.

At this stage we have to acknowledge that it is little more than an educated guess. It makes us less certain of our long EM equity position than we were. Nevertheless, we had already switched it out of an MSCI position into an Asia ex Japan in part because of US election risks and our strategists are particularly upbeat about Asian markets. They think they are cheap, they are positive on China and they think growth and hence earnings will surprise on the upside.

What about the rest of the world? Growth has been improving

Growth indicators have been improving around the world of late. Data since the US election would seem to support that with the PMIs in the Euro Area improving again and their equivalent in the US sustaining the gains seen last month. Our EM indicators remain robust and our China ACT indicator continues to indicate steady growth there too.

Our economists forecast 3.5% global GDP growth with EM growth around 4.7%. Our Euro Area growth numbers have been nudged back up towards 1 ½% with Brexit not proving to be as much of a drag as feared. We still expect the UK economy to see something of a slowdown in 2017 as the lagged effect of the fall in the pound hits consumer incomes. Perhaps our most optimistic view of the world, relative to consensus, comes from Japan where with fiscal policy turning more supportive (we put the package at 1.5% of GDP) we see growth at 1.4% in 2017.

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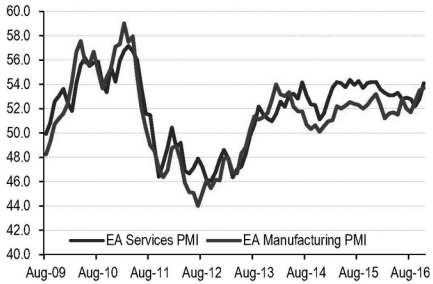
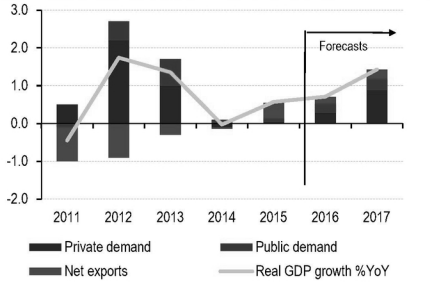
Chart 15: Eurozone PMI's point to solid growth



Source: Markit

Chart 16: Japanese growth expected to accelerate in 2017

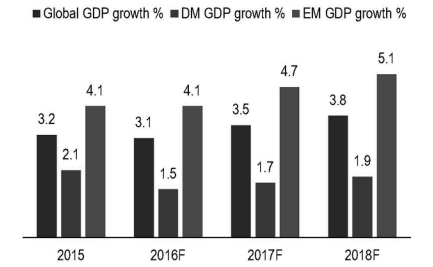


Source: BofA Merrill Lynch Global Research forecasts, CAO

It is a decent global growth picture and it is not impossible to imagine it being still better should the US surprise on the upside and the impact on trade from a Trump presidency prove to be modest.

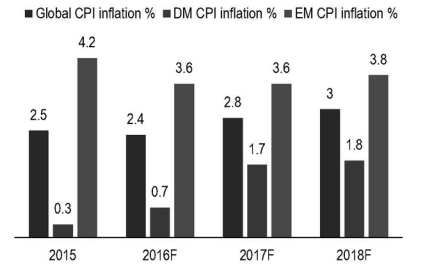
It certainly fits with the Peak Deflation theme since this stronger growth is expected to be accompanied by a pick-up in inflation. We have core PCE in the US reaching 1.9% next year in our core scenario. Our headline inflation numbers are higher because of the expected increase in the oil price from our commodity strategists. Indeed with oil expected to reach $60pb (OPEC permitting) headline CPI inflation in the US could push 3%. In the Euro Area we see headline inflation rising to 1.2%, albeit with core inflation only nudging modestly higher. UK inflation is expected to move markedly higher care of the lower pound, again with headline inflation pushing towards 3%. In Japan driven by our more optimistic view of the economy we project core CPI at 1%.

Chart 17: BofAML sees GDP accelerating into 2018...



Source: BofA Merrill Lynch Global Research

Chart 18: ...with inflation picking up too



Source: BofA Merrill Lynch Global Research

Politics – does populism strike again, this time in Europe?

Few would have predicted both Brexit and a Trump win in 2016. Both had something to do with the Peak Inequality and Peak Globalisation themes. Politicians on both sides of the Atlantic tapped into a deep disquiet, particularly amongst white male blue collar voters that they were not benefitting from this new globalised world. If opinion polls are to be believed (something which we have all learnt to question) then Italy may well end the year with another vote against the governing party - although that one is perhaps a little more complicated to dissect. We recently added a put spread on the eurostoxx to hedge against such a bad outcome here, which would be the case if it is perceived to be

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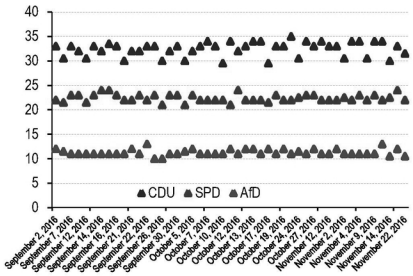
supportive of the 5 star movement or threatened the recapitalisation of the Italian banks (see Strategy Insights: Italy risks elevated).

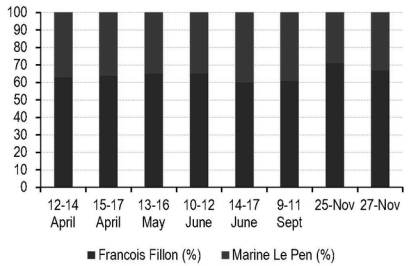
In 2017 the focus turns to core Europe, especially France and Germany. Because of the winner takes all system in France we find investors are more concerned with the situation there. Marine Le Pen and the Front National look likely to make it to the second round of voting (again according to polls) and until the vote comes in we suspect investors will be cautious about European markets. A Le Pen victory could likely bring the future of the EU and the Euro into question as she has talked about France withdrawing from both. That in turn has arguably the potential to be even more of an earthquake for the world's financial markets. Our central case is that centre right President is elected in France (with Francois Fillon now the official Republican candidate) and Merkel is returned at the head of a coalition government in Germany.

Chart 19: German polls show a consistent lead for Merkel's CDU party



Source: Allensbach (15-Sept, 13-Oct), Emnid (7-Sept, 14-Sept, 21-Sept, 28-Sept, 5-Oct, 12-Oct, 19-Oct, 26-Oct, 2-Nov, 9-Nov, 19-Nov), Forsa (2-Sept, 9-Sept, 16-Sept, 23-Sept, 30-Sept, 7-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov), Forschungsgruppe Wahlen (22-Sept, 13-Oct, 27-Oct, 10-Nov), GMS (14-Sept, 12-Oct, 12-Nov), Infratest dimap (21-Sept, 5-Oct, 19-Oct, 2-Nov), INSA (5-Sept, 12-Sept, 19-Sept, 26-Sept, 3-Oct, 10-Oct, 17-Oct, 24-Oct, 2-Nov, 7-Nov, 14-Nov, 22-Nov), Ipsos (10-Oct)

Chart 20: Fillon well ahead of Le Pen in polls showing a potential run-off



Source: Ifop (12-14 Apr, 14-17 Jun), BVA (15-17 Apr, 13-16 Mar, 10-12 Jun, 9-11 Sept), Odoxa (25 Nov), Harris Interactive (27 Nov). Note: all 2016.

Were this to be the case then we think there may well be room for a significant relief rally in European assets. Until then we think it likely investors will demand a higher risk premium.

Brexit was the big political topic for Europe going into 2016. Going forward we see it as an ongoing issue but mostly for the UK. The political uncertainty is likely to be extended, even after Article 50 is triggered as any significant negotiations probably need to await the outcome of the French and German elections. We expect the UK economy to struggle as the lagged effect of the fall in the currency hurts consumers and while there may be contrarian trades available in the GBP during 2017, our strategists think it goes lower first on the triggering of Article 50.

Bank of America Merrill Lynch

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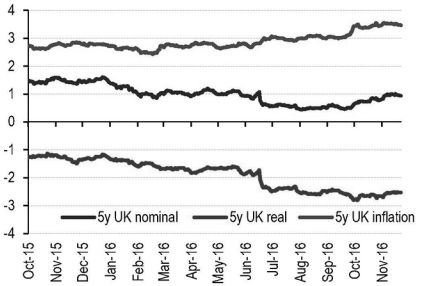
X Asset Trade Ideas

Rates – short 5Y US nominal and 10Y real rates, short 5Y UK real rates

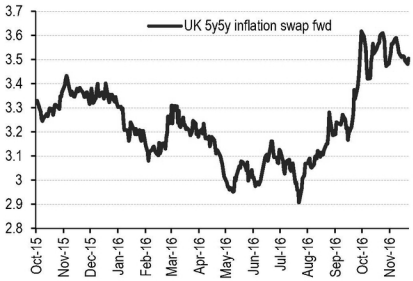
As discussed above on the rates side we keep our 2-5-10's butterfly but add a 10Y short real rates trade, to reflect the view of our fixed strategists that if yields are to go higher then real rates will need to move. So we will not repeat the analysis here.

Chart 21: Markets do not expect the BOE to react...



Source: Bloomberg

Chart 22: ...to a sustained overshoot of its inflation target



Source: Bloomberg

The other fixed income trade we continue to like is short 5Y UK real rates. The market continues to discount the Bank of England consistently overshooting its inflation target without a response on monetary policy. Yet Governor Carney and other members of the BOE's MPC have said that while they are willing to look through a short term inflation shock they would not tolerate a sustained overshoot.

The market therefore is pricing something which suggests that the BOE will sacrifice its credibility on the inflation side to (presumably) support growth. We would rather take the side of the Bank in this situation. It is worth bearing in mind too that those on the right of the Conservative party who have been critical of Governor Carney and the BOE have tended to want higher not lower short rates. When the PM and Chancellor have to replace the Governor at the end of 2018 it is unlikely that they are going to choose someone more dovish.

FX – long USD, short GBP, AUD, CNH

We have been long USD since August believing the risk reward to be skewed in favour of a stronger currency because we saw more room for the Fed to tighten than other central banks. Given the fiscal stimulus expected from the new administration the risks on that tightening profile have been skewed to the upside. We think the FX and Fixed Income strategists are right to think of the dot plot as a floor now for markets. With yields still needing to move higher to get there that should put further upward pressure on the USD. The scope for gains though depends on the currency. The Euro is already just 3.5% from the target for next year whereas both the GBP and the JPY have about 7-8% to fall to our FX team's targets. The team also continue to like short AUD positions as they think this also captures risk off in the event of concerns over China.

Whilst the short GBP has only worked modestly since the US election, we continue to think Brexit uncertainties will weigh on the currency into 2017 and our FX strategists target 1.15 in the aftermath of the article 50 decision.

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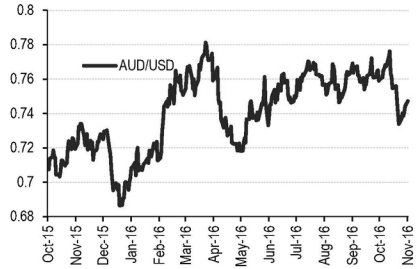
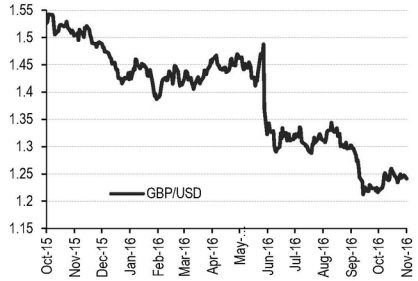
Chart 23: AUD fell post US elections...



Source: Bloomberg

Chart 24: ...GBP has held up so far but article 50 looms in Q1



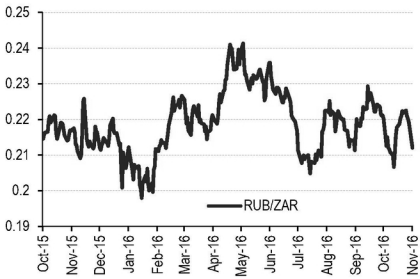
Source: Bloomberg

Today we add a CNH put (expressed as a USD/CNH call at 7.6 strike) partly because it fits with our positive USD call but also because it is a potential hedge against the trade rhetoric of the new administration descending into something more meaningful. Given the stated intent to declare the Chinese as currency manipulators and the concern that our currency strategists already have about the amount of reserves the Chinese hold, it is not impossible to imagine a much weaker CNY/CNH should the Chinese authorities allow a free float. We see this as a sensible hedge against our long EM equity position.

Chart 25: CNH continues to weaken, risk of more on trade tensions?

Source: Bloomberg

Chart 26: RUB/ZAR choppy on oil and SA politics



Source: Bloomberg

We have two other standalone currency trades, short EUR/SEK and long RUB/ZAR. The former has dropped as the EUR has weakened against the USD. We continue to think that the Swedish economy is more robust than the Eurozone and that the Riksbank will sooner or later have to adjust monetary policy accordingly. We see a lot more room for this pair to move in 2017, particularly if there are political concerns ahead of the French presidential elections as these will likely weigh on the EUR.

RUB/ZAR has been quite erratic since we re-established the trade, reflecting both volatility in the oil price and developments in South African politics. The latest no confidence vote against President Zuma underlines how tricky South African politics are at the moment. Concerns will remain on the economic progress of the country until the political situation becomes clearer. In the meantime we expect a higher risk premium to be associated with the currency.

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Equities: Add long Nikkei to EM Asia

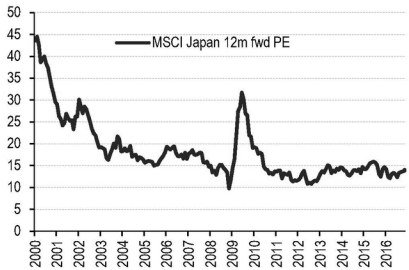
Global equity markets have gone in very different directions post the US election. EM have fared worst, Europe little changed, S&P at new all-time highs, the Russell and Nikkei on a tear higher. This is not how we were positioned so we need to ask the question of whether and what we need to change.

Table 2: MSCI EM Asia at a 2PE point discount to other equity markets

	MSCI EM Asia 12m fwd PE	MSCI Japan 12m fwd PE	MSCI Europe 12m fwd PE	MSCI US 12m fwd PE
Latest	11.9	14.1	14.3	17.0
Min	7.6	9.7	7.4	10.4
Max	18.5	44.5	23.9	25.2
Av	11.5	18.2	14.0	15.9
SD	1.8	6.8	3.4	3.2
Z-score	0.2	-0.6	0.1	0.3
%ile	68%	31%	60%	73%

Source: BofA Merrill Lynch Global Research, MSCI, IBES

Chart 27: Japan relatively cheap at 14.1x fwd earnings



Source: BofA Merrill Lynch Global Research, MSCI, IBES

If we stand back from the noise and just look at the valuations, the US is the most expensive, MSCI Asia ex the cheapest in absolute terms. Our strategists see decent earnings growth likely to come through in EM Asia, and while there is upside to US earnings estimates from potential corporate tax cuts at least part of it is priced in. Savita Subrahamian has a target for the US of 2300 in her year ahead Euphoria or fiscal fizzle?, an upside of a less than 5%. Our European strategists have an upside of around 6%. So that leaves EM Asia and Japan (given our 20k target) as the stand outs according to our equity strategists. Indeed, the PE of Japan is towards the bottom end of the range since 2000.

Sticking with EM Asia

One of our concerns on EM was a more hawkish Fed and therefore a stronger USD. So we regarded our positions in those asset classes as something of a hedge to our EM positions. As we explained above we are keeping that stance as on our central scenario there is more to go and on a risk scenario where bond markets overshoot the USD is likely to follow.

In the equity world, if our fixed income and FX forecasts are right, then we do not see them as being an impediment to our EM Asia position working again. Our EM strategists remain upbeat and Ajay Kapur actually upgraded his call to buy from a tactical pause post the election (A Call to Action: Time to BUY Asia/EMs). They think the right focus is one on growth rather than the USD and we continue to be upbeat on the prospects for EM growth, particularly in Asia. Ajay in particular makes the point that Chinese nominal GDP growth has been accelerating and that tends to be very good for Asian equity markets. Nigel Tupper's global wave has continued to improve and he argues that remains consistent with strong performance from Asia ex Japan equities.

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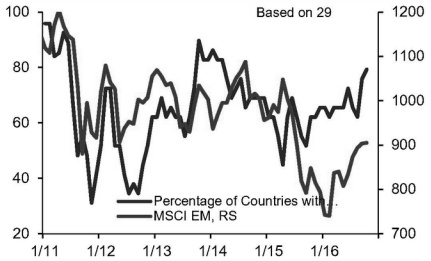
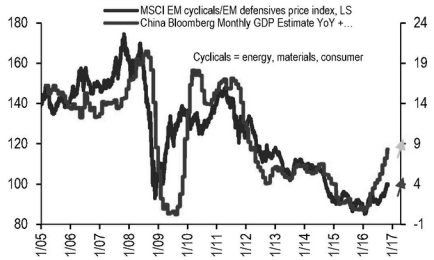
Chart 28: The world economy is improving – broad-based recovery – good for Asia/EMs



Source: BofA Merrill Lynch Global Research, Haver, Bloomberg

Chart 29: EM cyclicals outperform as China's NOMINAL GDP recovers. More to go.



Source: BofA Merrill Lynch Global Research, Bloomberg. Assumed GDP estimate for October-16 to be similar to that for September-16.

The question then is whether the strong USD or trade tensions from the new Trump administration can outweigh the more positive macro backdrop. We are inclined to back the view of our strategists and think that it will, so we are sticking with our long EM Asia position. We are doing so with hedges via a long USD and a CNH put.

Long Nikkei: target 20,000

We had previously paired our long EM position with a long US oil equity position, but with our US strategists downgrading the sector ahead of OPEC we removed it earlier this week. We were therefore looking for another pro-growth trade to run alongside our EM position. Long Japanese equities seemed the logical place to look. While we acknowledge we have missed the lows and that today's entry point may not be ideal, we suspect investors are not particularly long Japan yet since it was still showing as modestly underweight in the last Fund Manager Survey.

Chart 30: Net % AA say they are overweight Japanese equities

Source: BofA Merrill Lynch Global Fund Manager Survey

Our Japanese equity and FX strategist Shusuke Yamada has been arguing for a while that we would see both a weaker JPY and a rebound in Japanese equities. While arguably the JPY had turned beforehand, the Trump victory turbo charged the move. As the chart shows below Japanese equities do well historically during a period of bear steepening of the US yield curve. Our economists are also more upbeat on Japan thinking the weaker USD, the new policy stance of the BOJ and the fiscal stimulus will push growth and inflation higher next year.

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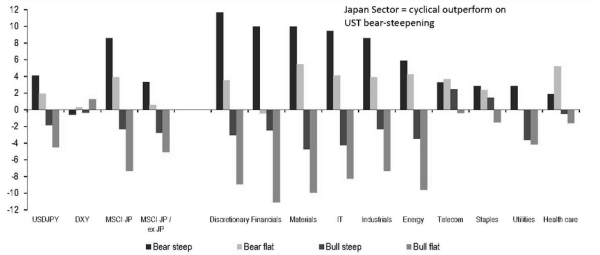
The combination of these factors suggest Japanese equities have further to run. We also see the position as being complementary to our EM position since whereas a stronger USD is a drag on EM performance, it is beneficial for the NKY position.

Chart 31: Japan equities have outperformed during US bear-steepening led by cyclicals, banks and insurance



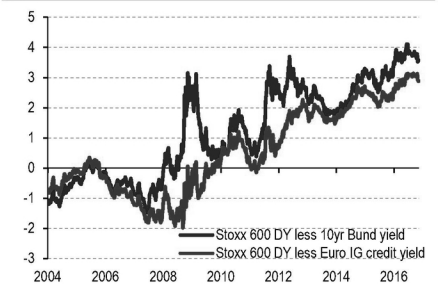
Source: BofA Merrill Lynch Global Research, Bloomberg

Curve movements based on 2yr move and 2s10s move (Bloomberg US Treasury yield index), so includes twist movements, but even if we exclude these implications do not materially change. Bear steepening (2yr + 16bps, 2s10s +33bps) = 11 quarters; bear flattening (2yr +26bps, 2s10s -20bps) = 10 quarters, bull steepening (2yr -48bps, 2s10s +28bps) = 10 quarters, bull flattening (2yr -27bps, 2s10s -30bps) = 12 quarters

Long Europe equities via yield stocks & index dividends

We continue to run two yield related trades in European equities. First, we remain long a broad selection of high yielding European equities. The dividend yield on offer in European equities is one of the asset class's key attractions. Europe offers a higher dividend yield than the other regions, with a 1.1% yield pick-up versus the DM average and 0.9% against EM equities. Those also look attractive relative to history: Europe's yield spread to DM ranks at the 87th percentile of the 20-year range. Europe's DY also looks attractive relative to sovereign and corporate bonds despite the recent sell off in fixed income markets: the yield pick-up relative to investment grade corporates is still 289bp. Given the concerns over European politics we prefer yield based strategies in Europe to those looking for capital appreciation at least in the short term.

Chart 32: Equity DYs remain attractive relative to credit & sov bond yields



Source: BofA Merrill Lynch Global Research, Bloomberg, Datastream

Chart 33: Europe offers a yield premium vs global equities too

Source: BofA Merrill Lynch Global Research, MSCI, Datastream

European Yield Screen

The rising rates backdrop has left yield not quite as scarce as it has been, but we continue to think investors should own yield where they can get it at decent value, such as in European equities. Last month we recommended investors rotate out of lower risk

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defensive dividend stocks to take advantage of the improving cyclical backdrop and rising bond yields. That meant our November screen included a high proportion of Financials. This somewhat remains the case but we note the addition of several industrial companies in our latest screen. As a reminder, to qualify the stock must be SXXP listed stocks with at least €2bn market cap, 4% DY, 1.2x DPS cover, 0% DPS 2YR CAGR and qualifying stocks must be on a Buy rating from our fundamental analysts. The yield on the basket is 5% with an average DPS CAGR of 7% and 1.8x covered.

Table 3: European Yield Screen – December 2016

Sedol	BofAML ticker	Company name	Sector	Divi Yield (>4%)	DPS 2Y CAGR	Div'd Cover
426330	DNBHF	DNB ASA	Banks	4.2	23.9	2.0
B545MG	XERSF	SWISS RE AG	Insurance	5.4	5.2	2.1
457481	MDIBF	MEDIOBANCA SPA	Banks	4.9	8.0	2.4
B1LB9P	SZCRF	SCOR SE	Insurance	5.3	4.3	1.9
BZ5739	ING	ING GROEP N.V.	Banks	5.3	4.6	1.7
538003	NRDEF	NORDEA BANK AB	Banks	6.6	2.1	1.3
BDVZYZ	ROYMF	ROYAL MAIL PLC	Industrial Goods & Services	5.0	4.2	1.8
458882	DNSKF	DANSKE BANK A/S	Banks	4.4	5.5	2.0
596651	SCGLF	SOCIETE GENERALE	Banks	5.6	0.6	2.0
021623	AIVAF	AVIVA	Insurance	5.1	9.9	1.8
B23K0M	CTAGF	CAPITA PLC	Industrial Goods & Services	5.7	2.5	2.1
522603	SAXPF	SAMPO PLC	Insurance	5.4	4.6	1.2
481334	SVKEF	SKAND ENSKILDA BKN	Banks	5.8	3.7	1.4
B17BBQ	IVTJF	INVESTEC	Financial Services	4.4	10.0	1.9
528983	EBKOF	ERSTE GROUP BK AG	Banks	3.6	12.5	3.1
766716	ATASF	ATLANTIA SPA	Industrial Goods & Services	4.9	11.2	1.3
B83VD9	MNGPF	MAN GROUP PLC	Financial Services	5.8	15.1	1.2
B5ZQ9D	EVKIF	EVONIK INDUSTRIES	Chemicals	4.4	2.9	1.7
B01FLG	GFSZF	G4S	Industrial Goods & Services	3.9	5.6	1.6
BGLP8L	IMIAF	IMI	Industrial Goods & Services	4.0	4.0	1.5

Source: BofA Merrill Lynch Global Research, Factset. The European Quality Yield Screen identified as a screen above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Merrill Lynch Global Research. This screen was not created to act as a benchmark.

Long SX5E 2018 Index dividend futures

With our second dividend related trade, we remain long SX5E 2018 index dividend futures (DEDZ8), a trade where we continue to see value even with the future price trading close to the high for the year. The 2018 contract implies a 4% decline in dividends paid from the 2016 level. In the absence of a recession, we think that is too pessimistic – 2013 was the last year to see a material 2-year decline in dividends (in the wake of the sovereign crisis and recession). The 2018 contract also still trades at a discount to the level implied by our stock analysts' DPS forecasts. Our derivative strategists using BofAML forecasts for 2018 estimate 8% upside from current prices. Although the upside is now more limited the risk around this trade is also much lower now. The pull to par effect will become the dominant driver over the coming months and the full year results should provide clarity on where the 2018 contract will settle.

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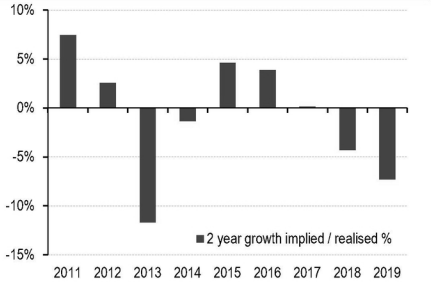
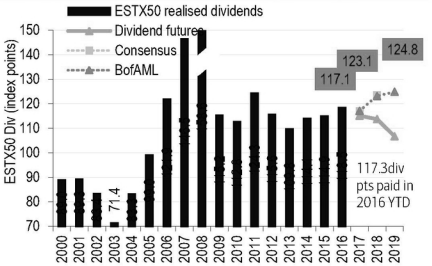
Chart 34: SX5E dividends: 2-yr implied growth in 2018 still looks cautious



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 35: BofAML's SX5E Dec18 div forecast implies 8% upside



Source: BofA Merrill Lynch Global Research, Bloomberg

European equities: switch to outright long Healthcare

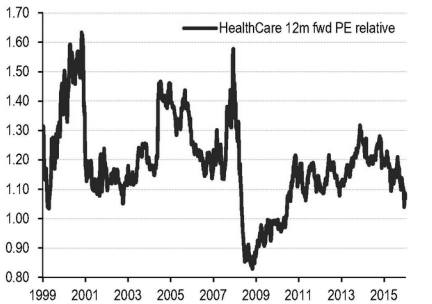
We switch our European sector pair trade preferring Healthcare over Food & Beverage into an outright long in Healthcare. Both sectors have suffered versus the market from the rotation out of defensives and bond proxies. That has reduced the valuation of the Food & Beverage sector to less extreme levels. Meanwhile Healthcare looks very attractively valued and we see compelling risk reward in the sector on an outright basis at current levels.

The fundamental bull case for Health rests on the strong pipeline of new products for the big cap pharma universe. Our sector analysts forecast EU Pharma to deliver a 2018-21E EPS CAGR of 11%, up from mid-single digit levels in recent years. Historically that would justify a PE re-rating and a multiple for the pharma sub-sector nearer 17-18x than the current 13x 2018 PE.

Chart 36: Extreme overvaluation in Food & Bev has moderated

Source: BofA Merrill Lynch Global Research, Datastream, IBES, Bloomberg

Chart 37: Healthcare PE – back near market multiple and patent cliff lows



Source: BofA Merrill Lynch Global Research, Datastream, IBES, Bloomberg

We believe the Republican clean sweep in the US elections represents a positive catalyst as it significantly decreases the potential for legislative initiatives to aggressively control drug pricing in the US. The catalyst for the sector to re-rate will come progressively from newsflow around new products. The next 12 months should see progress on this front with several of the European large caps expected to announce key data on important drugs in 2017.

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Healthcare's forward PE is now down to just a 7% premium relative to the market and nearing the valuation lows recorded in 2010-12 when the patent cliff was at its worst and pipelines were very weak. Today pipelines are twice the size they were in 2011 and innovation is the key to growth in the sector - pricing power remains strong in drug categories with differentiated products.

Credit: Long Spreads in Europe and US

Europe: Long Xover short Main

Rate cuts are off the table it seems, as central banks are starting to recognise the side effects of NIRP. This reinforces our view that a continuation of CSPP, entails that the reach for yield will extend to those assets that have not seen it yet; long Crossover vs iTraxx Main.

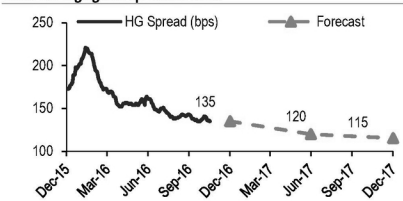
The beta outperformance has already started in the cash market. We look at synthetics and we see that Crossover has not mirrored that performance. Even though XO has outperformed recently, it still has further to go to close the gap vs cash market's performance.

Ioannis Angelakis thinks that rising political risks in the following twelve months are more likely to weigh on iTraxx Main performance than Crossover, as Main has higher concentration vs XO on names domiciled in countries with elections.

Buy 30y US IG Industrial spreads

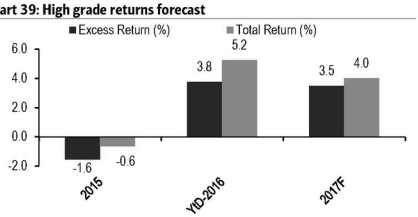
US high-grade is the market our colleagues in Credit Strategy are most bullish into 2017. Hans Mikkelsen thinks IG corporate spread maturity curves super-flatten as global credit investors do the twist - i.e. sell shorter maturities and buy the long end. Foreign inflows are now concentrated in the back-end, as credit spreads have rallied while the cost of currency hedging increased. That means that only the back end of the steep US corporate spread curve offers enough spread to overcome the high cost of currency hedging. The flip side is that the front end of the US credit spread curve is very unattractive and we expect domestic and foreign investors to accelerate their selling of shorter maturity US corporate bonds. Overall, Hans expects the 30yr corporate bond part of the market to generate 8%-9% total returns next year.

Chart 38: High grade spread forecast



Source: BofA Merrill Lynch Global Research

Chart 39: High grade returns forecast



Source: BofA Merrill Lynch Global Research

Long AT1s basket

Contingent capital continues to offer a compelling premium to European HY and lower volatility than bank equity. The asset class also received a boost last week when the European Commission submitted a proposal for AT1 coupons to be prioritized over common dividends and bonuses if the bank breaches its combined buffer. This placates one of the main concerns investors have, i.e. that banks could decide to skip a coupon payment but maintain their dividend. The confirmation of the role of AT1s in Pillar 2 capital is another example of regulators providing clarity on how contingent capital fits within the overall capital structure. The main short term risk for the trade is the fate of the Italian banks recap, so we will be watching closely to see how that develops.

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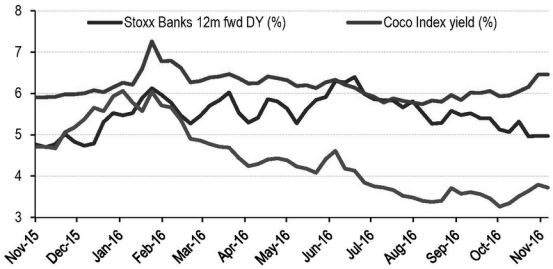
Chart 40: European AT1s offer a compelling yield for total return investors

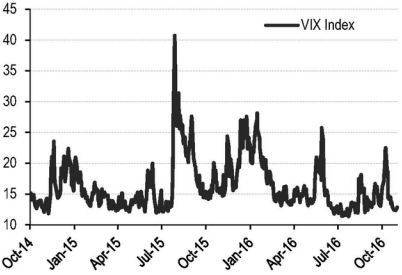


Source: BofA Merrill Lynch Global Research, Bloomberg, Datastream, IBES

Volatility: Sticking with Relative trades

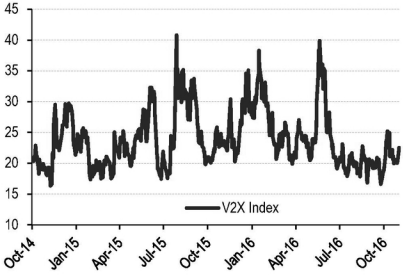
While 2016 started off with a bang volatility wise it has ended with a whimper. Neither Brexit nor the US presidential election proved to be anything more than a blip. Realised vol in the S&P 500 over the last 100 days is just 9.5%. That compares to 13.6% for the Eurostoxx 15.1% for the Russell and 21.8% for the NKY.

Chart 41: Neither the Trump election...



Source: Bloomberg

Chart 42: ...nor Brexit led to a sustained period of higher volatility



Source: Bloomberg

That is why we prefer relative variance trades. They tend to carry flat to positive but have convexity to the downside. We are happy to continue to run these trades into 2017 and then use shorter term instruments to hedge specific events.

We did this around Brexit and have recently bought a 3000-2850 Eurostoxx put spread to hedge our European exposure around the Italian referendum. While a No vote is expected we are not sure what the aftermath will look like and there is considerable uncertainty over the bank recapitalization of the banks afterwards.

We also have a calendar put spread in eurostoxx which tends to pay off best around the 2500-2600 levels so that remains something that we will look to keep for now given downside risks in Europe over the first half of next year.

One trade we are taking off today is our Kospi forward vol position. We had held that as a hedge against a China hard landing. Our derivative strategists no longer like it and we have no opted for a currency hedge for our China risk, as discussed above.

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Risks to trades

Equity trades

- The risks to long divi basket & Pharma trades are a steepening of rates curves and better than expected growth outside of Europe causing investors to rotate out of bond proxies. Plus our analysts' expectations of improved earnings from the healthcare pipeline not coming through.

- The risks to trade dividend future trade is lower than expected profits for major European sectors, e.g. Banks, Oils, causing a correction in dividend expectations.

- The risk to EM Asia ex-Japan is from a stronger USD and faster than expected US rates hiking cycle. Trade tensions with the new US administration an additional risk now.

- Risk to long Nikkei trade is a reversal of JPY weakness or a change in policy by the BOJ.

Fixed income trades

- The risks to the US rates trades are a dovish Fed responding to a tightening of monetary conditions before the fiscal boost kicks in. Disappointment on the fiscal stimulus also a risk. The risk to the UK inflation trade is that the BoE doesn't respond to expected rising inflation by raising rates faster.

- The risks to the Industrial spreads trade is a deterioration of US industrial growth and step away from credit purchasing by ECB/ BoE.

- The risks the AT1 trade are the ECB pulling out of the credit markets causing a correction in the riskier portion of the market and bank profitability deteriorating raising concerns about default.

- The risks to our XOVER trade are Eurozone growth disappointing and a risk-off event in markets causing a flight to quality amongst credit investors.

Volatility trades

- Our equity vol trades are hedges, the risks are that they expire worthless due to the lack of a financial event in China and persistent low vol spread in equity markets supported by higher growth.

FX trades

- The main risk to our FX trades is of a more dovish than expected Fed, a more hawkish than expected BOE, improved politics in South Africa/weaker oil price and a more dovish Riksbank.

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Appendix 1: Methodology

This publication is aimed at multi-asset institutional investors who tend to have a longer term time horizon for their investments. As such, we will be looking to come up with ideas that will have a minimum six month horizon and ideally longer than a year. The individual trade ideas will be sourced from our strategists across BofA Merrill Lynch Global Research.

This publication is not meant to be an agglomeration of all the trade ideas published by BofAML Global Research strategists, but instead represents those that fit with our longer term themes (as opposed to shorter term tactical trades). In addition, there may be several different trade ideas published by BofAML Global Research strategists across different asset classes that seek to leverage off of the same theme. In most cases we will seek merely to take the trades that have the best risk adjusted return. By risk adjusted we mean the risk undertaken in a trade vs the likely return on that trade. In considering that we will look at the underlying volatility in the individual asset class. This will be combined with our own view of what the likely downside is in an adverse scenario vs the payoff in the expected scenario and our own assessment of the likelihoods of such scenarios.

Once selected it is assumed that the trade would likely be retained for a minimum of six months (as per the selection rationale). Should any analyst change their view on the trade and cease to recommend it, then it will be immediately removed from our list[1]. Equally should our target be met for a trade and the relevant strategist feels it has run its course then it will also be removed (see footnote). Otherwise we will review our trades on a monthly basis in this publication. If we feel a new trade idea has a better risk adjusted return than an existing one in the same asset class then we would replace it.

The objective of the trades is that they would be suitable for a typical objective of the multi-asset fund managers, which is typically framed in terms of a Libor+ benchmark (this can be anything from Libor +300bp to Libor +700bp). That return is also coupled with a target volatility, for example half MSCI ACWI volatility. The volatility target will, of course, be a function of the expected return, but there is a general focus on producing lower volatility returns. Our set of trades should not be regarded as a portfolio but a collection of ideas to implement in a multi-asset portfolio.

Appendix 2 – Recommended COCO bonds

Table 4: COCO basket

ISIN	Bond	Issuing entity	Price	Mid YtM
XS1055037177	ACAFP 6.5% EUR Perp-21	CREDIT AGRICOLE SA	100.5	5.4
XS1002801758	BACR 8% EUR Perp-20	BARCLAYS PLC	100.9	7.1
XS1033661866	BBVASM 7% EUR Perp-19	BANCO BILBAO VIZCAYA ARG	91.1	7.1
XS1073143932	NYKRE 4% EUR 2036-21	NYKREDIT REALKREDIT AS	102.4	2.7
XS0972523947	CS 5.75% EUR 2025-20	CREDIT SUISSE	107.6	3.6
DE000DB7XHP3	DB 6% EUR Perp-22	DEUTSCHE BANK AG	78.3	6.7
XS1043545059	LLOYDS 6.375% EUR Perp-20	LLOYDS BANKING GROUP PLC	97.5	5.7
XS1171914515	RABOBK 5.5% EUR Perp-20	COOPERATIEVE RABOBANK UA	98.5	5.5
XS0867620725	SOCGEN 6.75% EUR Perp-21	SOCIETE GENERALE	98.8	5.9
XS1107890847	UCGIM 6.75% EUR Perp-21	UNICREDIT SPA	84.5	7.7

Source: BofA Merrill Lynch Global Research *As of 28/11/2016 close

[1] Under these circumstances, we will publish a note immediately.

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Appendix 3 – Indicative pricing/ levels

Table 5: Latest indicative pricing/ levels for cross asset trades

Asset	Trade idea	Indicative price / level
Equities	Long European Quality Yield Screen (yield)	5%
	Long SXDP Index	**681.6**
	Long Nikkei	**18307**
	Long European index dividend futures	113.4
	Long MSCI Asia ex-Japan	525.7
Equity vol	Long RTY short SPX 2y variance swap	3.7**
	3000-2850 SX5E put spread Dec 16 expiry	1.20%
	Long NKY short SPX Dec 18 variance swap	6vols
	Long SX5E short SPX Dec 18 variance spread	6vols
	Eurostoxx 2y/3y put calendar	1.99
FX	Short EUR/SEK	9.762
	Long USD/CNH call	**0.56%USD**
	Short GBP/USD	1.250
	Long USD/AUD	1.342
	Long RUB/ZAR	0.213
Fixed Income	2s-5s-10s fly (bp)	11
	Short US 10y real rates (bp)	**50**
	Paying 5y GBP real rate swap (bp)	-254
Credit	Buy 30y US IG Industrial spreads (bp)	187
	Buy basket of Euro AT1s	5.80%
	Long Xover short Main (ratio)	4.22x

Source: BofA Merrill Lynch Global Research, Bloomberg. Note: *all levels and prices as of 29/11/2016 at ~3pm or most recent local market close. **This is a theoretical level which may differ from actual tradable prices. ***This level is obtained by bootstrapping At-the-money forward volatility levels, does not represent a tradable instrument. The tradable strike of an FVA will likely differ considerably.

Appendix 4 – Closed trades

Table 6: Closed trades

Asset	Trade idea	Strategist	Open date	Closed date
Equities	Long Nikkei	Kenji Abe	22/01/2016	01/04/2016
	Long MSCI EM 1x 1x call ratio	Ajay Kapur	01/03/2016	18/04/2016
	Long MSCI EM 1x 1x call ratio	Ajay Kapur	01/03/2016	18/04/2016
	Long US Energy	**Savita Subramanian**	**07/09/0216**	**28/11/2016**
	Long MSCI EM	Ajay Kapur	19/04/2016	30/09/2016
	Long SXDP Index vs Short SX3P Index	**Ronan Carr**	**22/01/2016**	**28/11/2016**
Equity vol	Long June V2X call spread collar	Abhinandan Deb	01/04/2016	18/04/2016
	Long Kospi fwd vol 6M/18M	**William Chan**	**22/01/2016**	**28/11/2016**
	Short June V2X put	Abhinandan Deb	01/04/2016	Expired
	Long (30-35) V2X Jul call spreads	Abhinandan Deb	18/06/2016	Expired
	Long 2050-1950 S&P 500 Jul put spread	Abhinandan Deb	18/06/2016	Expired
FX	Long NOK/USD	Kamal Sharma	01/03/2016	04/05/2016
	Long RUB/ZAR	David Hauner	22/01/2016	17/05/2016
	Short EUR/SEK	Kamal Sharma	22/01/2016	08/07/2016
	Long JPY/KRW	Adarsh Sinha	22/01/2016	31/03/2016
	Long USD/CAD	Ian Gordon	28/07/2016	07/07/2016
	Short EUR/JPY	Athanasios Vamvakidis	21/01/2016	30/09/2016
	Short EUR/USD	Athanasios Vamvakidis	08/07/2016	04/11/2016
Fixed Income	Short EUR 5Y5Y inflation breakevens	Ralf Preusser	22/01/2016	23/01/2016
	Buy 30y real rates (bp)	Ralf Preusser	22/01/2016	24/05/2016
	Receive EUR pay US 5y5y fwd (bp)	Ralf Preusser	22/01/2016	27/05/2016
	Sell 6m 2s-5s-10s OTM receiver fly	Shyam R. Rajan	07/09/2016	08/09/2016
	US +15y IG credit (total return)	Hans Mikkelsen	22/01/2016	04/05/2016
	US +15y IG credit (Govt OAS)	Hans Mikkelsen	04/05/2016	28/07/2016
	Paying 2y3y GBP real rate swap	Mark Capleton	02/09/2016	12/10/2016
	3y 2s-10s US flattener	Shyam R. Rajan	27/05/2016	10/10/2016

Source: BofA Merrill Lynch Global Research. **Trades closed in this report (or recently) in bold.**

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European Equity Strategy

2017 year ahead – Refining the reflation rotation

Bank of America Merrill Lynch

01 December 2016

Equity Strategy
Europe

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Key takeaways

- 2017 - Reflation, Reversal, Rotation, Relief or Revolt. EPS to turn +ve but politics to remain a valuation overhang in H1.
- Defensive vs Cyclical rotation at extreme levels. More balanced approach needed but look for another leg to cyclical trades.
- O/w Media as quality cyclical and Oil. Stay cautious on UK domestic (Retail, Travel). Health, Utilities over Food & Bev.

2017 – A year of cross currents, nimble investors required

Recovery (positive but moderate in our view) and Rotation go hand in hand - we think that the pace of the rotation has to moderate. ECB reversal on QE is a risk and tapering because the ability or willingness to do QE fades would likely cause a setback. Investors will demand a premium for political risk until we get clarity on populist Revolt or policy Relief in France and elsewhere. Like 2016 investors will need to trade the ranges.

High single digit upside - politics likely to weigh near term

A valuation overhang remains in Europe vs other DM. We see a return to positive EPS growth (+7%) in Europe for the first time since 2014, driven by higher global GDP growth Resources recovery, capex discipline and FX. +7% growth implies less downgrades than usual (10% is the average). Base case upside in high single digits (c9% total return) but politics may mean market highs are more likely achieved in H2.

Modestly higher yields and higher equities compatible

Equities can continue to perform with rising rates – the key is that inflation breakevens are not falling. However, a more aggressive bond sell-off taking Treasury yields to 3% or higher would undermine EM, the growth outlook, peripheral spreads and risky assets.

Reflation rotation stretched – refining our approach

Rotation has been extreme (>6SD move in Def vs Cyclicals). Argues for a moderation in returns and a more balanced approach to sector allocation. Look for another leg to cyclical trades in the New Year. Sector valuations have also moved a long way already.

Cautious on domestic UK exposure – Brexit still to bite

The full impact of sterling weakness on the UK consumer environment is yet to be felt and Brexit negotiations are likely to drive further uncertainty and FX volatility. Structural issues add to our concerns in Retail and Travel & Leisure (both underweight).

O/w Oil, Health, Utilities, Media; u/w Food & Beverage

An OPEC cut and higher oil would make Oil's high DY sustainable. Healthcare is too cheap vs an improving sector growth outlook and 2017 is a key year for pipeline news. Food & Beverage still seems the least attractive Defensive on valuation, positioning. We move overweight Media, a quality cyclical that has lagged and seen valuations de-rate.

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Timestamp: 01 December 2016 12:00AM EST

Refining the reflation rotation

2017 is likely to have a number of cross currents as themes. Recovery (we look a modest acceleration in both growth and inflation) and **Rotation** go hand in hand. On the basis of our central forecasts for growth, inflation and rates and given the moves in the market already we think that the pace of the rotation has to moderate. (In-line with that we recently downgraded of banks and miners).

Reversal refers to the ECB. Our economists are not yet convinced that the ECB will start to unwind loose policy 2017 but the probability is increasing. An ECB that tapers because growth and inflation are improving would be supportive for markets, notably banks. But tapering because the ability or willingness to do QE fades would likely cause a setback. **Relief or Revolt** relates to European politics. Will Europe follow the route to populism (revolt from the voters) or will we find relief for the markets by the end of 2017 from a Fillon/Merkel duo being in charge of the Euro area's two largest economies. We think investors will demand a higher risk premium until the French Elections in May 2017

Valuation are reasonable at 14x PE but Europe is cheap on a relative basis and the **valuation overhang remains evident in the region's equity risk premium**, which implies 11% upside to get back to 5-year average levels. We see a **return to positive EPS growth (+7%)** in Europe for the first time since 2014, as 3.5% global GDP growth should deliver positive earnings growth (supported by Resources recovery, capex discipline and FX. +7% growth implies less downgrades than usual (10% is the average).

Bond yields and equities – stable/higher inflation breakevens are key. Equities can continue to perform in an environment of higher rates – the key is that inflation breakevens are not falling. However, a more aggressive bond sell-off taking Treasury yields to 3% or higher would undermine EM, the growth outlook and risky assets.

The **rotation out of bond proxies and Defensives into Financials and Cyclicals has moved to extreme levels**: relative performance of Financials / Cyclicals versus Defensives rose over 6SD in 10-14 months. Technical metrics are at historical extremes, arguing for a moderation in relative returns and a more balanced approach to sector allocation is justified right now. Look for another leg to cyclical trades in the New Year.

Sectors have also moved a long way already from a valuation perspective. Financials are now trading around median relative valuation levels. Healthcare PE relative is at the bottom of the historical range and Utilities relative PE is also close to the prior low hit in 2013. Food & Beverage still commands a large premium and PE-relative is 6-10% above the 2010 / 2014 lows.

We remain cautious on domestic UK exposure. The full impact of sterling weakness on the UK consumer environment is yet to be felt and Brexit negotiations are likely to drive further uncertainty and FX volatility in our view. Structural issues add to our concerns in Retail and Travel & Leisure (both underweight).

Overweight Oil, Healthcare, Utilities, Media; underweight Food & Beverage. If OPEC cuts production and oil recovers up to the high $50s per barrel, Oil sector EPS and cash flows can recover significantly and make the highest DY in market (6%) look sustainable. Healthcare we believe is too cheap relative to an improving sector growth outlook. 2017 will be an important year for newsflow on key pipeline drugs. Evidence of success can drive a re-rating independent of macro. Despite the recent sell-off, among defensives and bond proxies Food & Beverage still seems the least attractive. Valuations are among the most expensive in the market and overweight positioning has not corrected materially yet. We move overweight Media, a wuality cyclical that has lagged badly and seen valuations de-rate.

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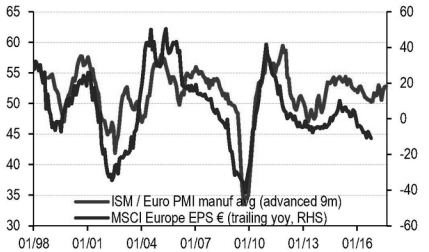
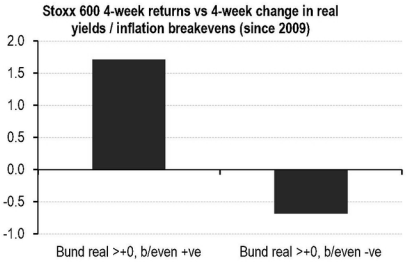
Key charts

Chart 1: Synchronised rise in leading indicators globally augurs well for earnings recovery – especially if PMIs kick on to or above mid-50s



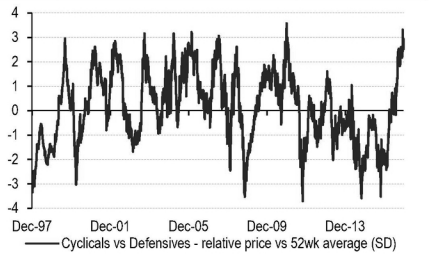
Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 2: Modestly higher yields and higher equities compatible – Rising inflation breakevens the key for equities



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 3: Cyclicals vs Defensives trade now looks very stretched



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 4: Likewise Financials vs Defensives: -2.5SD to +2.5SD post-Brexit

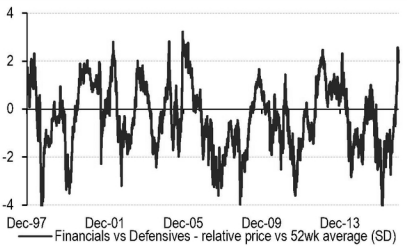


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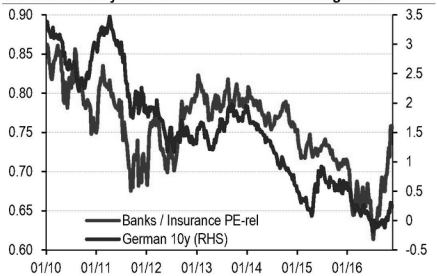
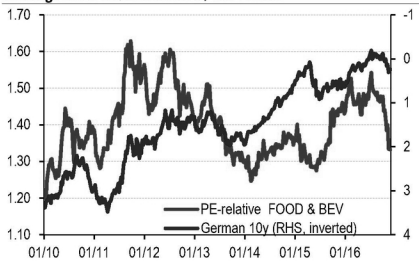
Chart 5: Financials valuations have recovered significantly relative to the move in bond yields – relative PE back around average levels



Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 6: Rapid relative de-rating for Staples – relative PE for Food & Beverage still 6-10% above 2010 / 2014 levels



Source: BofA Merrill Lynch Global Research, Datastream, IBES

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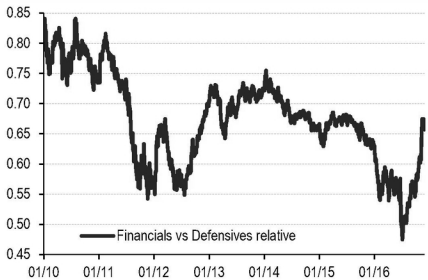
Lessons from 2016

The old joke is that Year Aheads are frequently out of date by the end of year they are written in. There is a real danger of that this year given the speed which things have moved since Brexit and more recently the US election. The two charts below show that Financials and Cyclicals have clawed back around 2/3 of their underperformance vs Defensives. Of course it depends how you frame the question since we have included Utilities and Telecoms in the defensive basket. But when we downgraded Banks 10 days or so ago they had outperformed Food and Beverage by ~50% since the lows of early July. Whichever way you cut it some of these moves have been extreme.

Chart 7: The moves since Brexit in both Financials...



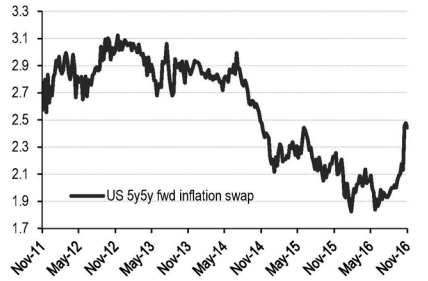
Source: Bloomberg

Chart 8: ...and Cyclicals relative to Defensives has been dramatic

Source: Bloomberg

Moreover, in 2016 we doubt that even if investors had known the results of key events that they would necessarily have got the reaction in markets right. As we joked in our Cross Asset year ahead you needed not so much a crystal ball as a time machine to have got things completely right this year. Aside from Brexit and Donald Trump winning the US election it is easy to forget that in February we were worrying about a US recession and deflation. US 5Y5Y forward breakeven inflation rates actually troughed at 1.8% at that point. Four months later we were worrying about the deflationary impact of Brexit. Now we are thinking about the reflation under a Trump Presidency.

Chart 9: US 5Y5Y forward inflation troughed in February



Source: Bloomberg

Chart 10: At the same time as Basic Resources

Source: Bloomberg

The panic in markets in early February actually presented a perfect buying opportunity for reflationary assets. Miners was a sector truly loathed by investors of all colours at the start of the year with many thinking that some of the big players might even go bust. If there is one key conclusion from all of this it is do not tie yourself to a view. We

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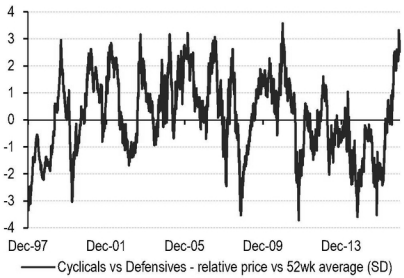
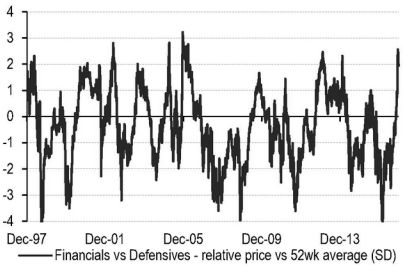
were underweight at the start of the year too and missed the lows. We recognized we were wrong and closed our underweight and while it took us a while but we eventually managed to go overweight in September. The lesson of that is that themes are great, but when the facts change strategists and investors have to change their minds.

Chart 11: Cyclicals vs Defensives: from -3.5SD to +3.2SD in 14 months



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 12: Financials vs Defensives: -2.5SD to +2.5SD post Brexit



Source: Re BofA Merrill Lynch Global Research, Bloomberg place this text

In fact your best guide to this year was to buy something when it has oversold, underowned and unloved, like Miners and Emerging Markets in February, Banks in July, the Nikkei the day of the US election and sell when the opposite e.g. bonds and defensive equities shortly after Brexit. Our CTI models did actually pick up a number of those events as the table below shows. It also got picked up by our standard deviation analysis. We acted on some but not all of these readings. The lesson, with the benefit of hindsight, is to pay more attention to them. Indeed, our recent decision to downgrade both Banks and Basic Resources reflected very high readings on our models.

Table 1: Reflation rotation very stretched on our CTIs post-Trump

Asset	11/11/2016	10/11/2016	09/11/2016
EUR/GBP	-46	-44	-12
German 10y Bonds	66	61	24
US 10y Bonds	96	96	93
Stoxx Banks	80	71	0
Stoxx Basic Resources	92	93	92
Stoxx Food & Beverages	-84	-96	-54
Stoxx Insurance	67	64	23
Stoxx Personal & Household Goods	-34	-75	-7
Stoxx Utilities	-92	-94	-19
Relative CTI			
Relative Stoxx Banks	86	87	50
Relative Stoxx Basic Resources	100	100	99
Relative Stoxx Food & Beverages	-93	-93	-89
Relative Stoxx Insurance	92	91	76
Relative Stoxx Media	-34	-77	-87
Relative Stoxx Pers&Hhold Goods	-92	-94	-75
Relative Stoxx Technology	-80	-74	-55
Relative Stoxx Telecom	-91	-92	-28
Relative Stoxx Utilities	-82	-92	-59

Source: BofA Merrill Lynch Global Research, Bloomberg

Table 2: While opposite true immediately post-Brexit

Asset	29/06/2016	28/06/2016	27/06/2016
Relative Stoxx Autos	-95	-39	-9
Relative Stoxx Banks	-80	-83	-86
Relative Stoxx Basic Resources	21	3	0
Relative Stoxx Chemicals	2	19	40
Relative Stoxx Construction & Materials	-10	-36	-71
Relative Stoxx Financial Services	-91	-91	-92
Relative Stoxx Food & Beverages	60	78	82
Relative Stoxx Healthcare	88	88	88
Relative Stoxx Industrial Goods & Services	-47	-35	-44
Relative Stoxx Insurance	-87	-94	-94
Relative Stoxx Media	-6	-13	-35
Relative Stoxx Oil & Gas	93	86	91
Relative Stoxx Personal & Household Goods	57	58	70
Relative Stoxx Retail	-63	-81	-75
Relative Stoxx Technology	0	0	0
Relative Stoxx Telecom	3	0	-16
Relative Stoxx Travel & Leisure	-98	-100	-100
Relative Stoxx Utilities	65	6	2

Source: BofA Merrill Lynch Global Research, Bloomberg

We think 2017 is another year where investors will need to be nimble. Markets have responded enthusiastically to a prospective Trump Presidency but as the above charts suggest we may well have discounted much of it. That is also supported by our fixed income and FX forecasts, which suggest much has already been priced in. In addition we have political risk starting with next weekend's Italian referendum stretching to the German elections in Autumn 2017. In the middle we have the crucial French elections. A

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Marine Le Pen victory could bring into question both the future of the EU and also the euro, should the polls be close it could make the uncertainty and market moves around Brexit look like a walk in the park.

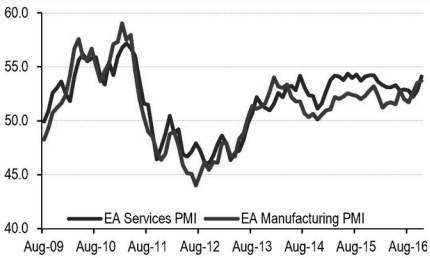
2017 – Reflation, Reversal, Rotation, Relief or Revolt?

2017 is likely to have a number of cross currents as themes. **Recovery and Rotation** go hand in hand. The stronger the recovery the more yields can rise the more we can see the rotation extend. Should investors become concerned that the recovery is stalling or that yields are peaking the rotation would likely stall potentially even reverse. **Reversal** refers to the ECB. Our economists are not yet convinced that the ECB will start to unravel some of its easing measures in 2017 but they do expect the debate to be a vigorous one within the ECB. For the first time Gilles Moec thinks there is a chance that the ECB will indeed choose to taper. **Relief or Revolt** relates to the French election. Will Europe follow the UK and US lead of 2016 and go down the route of populism (revolt from the voters) or will we find relief for the markets if by the end of 2017 from a Fillon/Merkel duo being in charge of the two largest economies in the Euro Area.

Recovery – the world looks a better place going into 2017

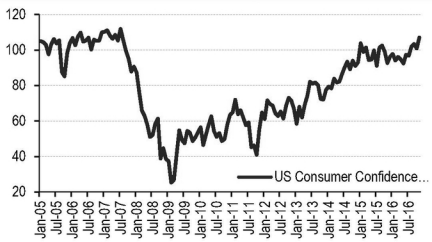
Reflation has been the big theme of the second half of the year. As we had noted in previous publications there had been something of an improvement in the global growth picture emerging even before the US election. It started with Emerging Market growth, which our GEMScycle has been showing to be accelerating for some months, but seems to have spread to other parts of the developing world. US GDP for Q3 has just printed a revised 3.2%, with a number of indicators, such as ISM's, PMI's and consumer confidence pointing to a solid Q4 to follow. That quarter is currently tracking at 3.6% according to the Atlanta Fed.

Chart 13: Eurozone PMI's have picked up of late...



Source: Markit

Chart 14: US Consumer Confidence now at post-GFC highs



Source: Bloomberg

The Euro Area too is showing signs of improvement with the latest manufacturing PMIs back to their best since early 2014 with other national surveys, such as Ifo pointing in the same direction. The composite PMI is back close to the year highs too. The UK numbers continue to surprise on the upside too for the moment. Our economists are also upbeat on Japan with growth expected to accelerate next year as the fiscal stimulus kicks in.

Accordingly our economists expect growth to rise from 3% this year to 3.5% in 2017 and 3.8% in 2018. That acceleration in growth is despite a slightly slower US economy in the first half of the year as a higher USD and interest rates dampen growth before the fiscal stimulus kicks in. With growth firming and oil prices expected to be higher inflation is also expected to pick up through 2017 and 2018 to 2.8% and 3% respectively. At this stage it is worth noting that this is a modest acceleration in both growth and inflation.

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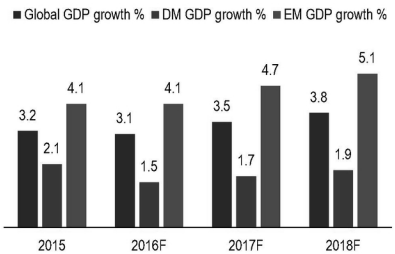
The Fed is accordingly expected to proceed cautiously at least initially. In part for that reason our fixed income and FX strategists have only a modest further increase in bond yields and the USD in their forecasts for next year. They project 10Y US Treasuries rising to 2.65% and the USD to 1.02 vs the EUR. The dollar is expected to strengthen more aggressively against both the GBP and the JPY, but even so the gain in the currency overall has been frontloaded into 2016.

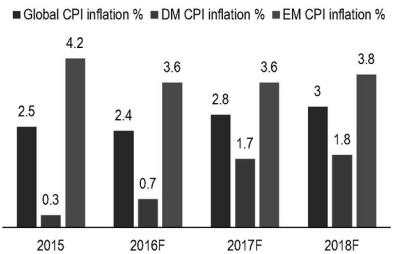
Our economists and strategists are cautious partly because the fiscal stimulus is expected to have only a modest impact on growth, at around 0.5% of GDP. That is based on the assumption that some of the proposals will get watered down and that the tax cuts have a relatively low fiscal multiplier. Our US economists think that should the fiscal stimulus be larger and more effective (for which read more infrastructure) then US growth could surprise on the upside to around 3% in 2017 and 3.5% in 2018. That in turn would mean a more aggressive Fed and in all likelihood a bigger rise in yields and the USD.

Chart 15: BofAML sees GDP accelerating into 2018...



Source: BofA Merrill Lynch Global Research

Chart 16: ...with inflation picking up too



Source: BofA Merrill Lynch Global Research

Reversal: There is good taper and bad taper

The outcome of that would likely affect ECB behaviour too. Our central expectation is for Euro Area growth of around 1 ½% and inflation nudging only modestly higher. A much more robust global economy and a stronger USD (presumably weaker EUR) would likely put upward pressure on both of those. Indeed, in such an environment it is not impossible to think of 10Y Treasuries pushing through 3% and the USD breaking parity against the EUR.

That in turn would increase the pressure on the ECB to start to reverse its very loose monetary policy stance. Tapering would then become much more likely. It would likely push European bond yields higher too, certainly above the 65bp forecast for Bund yields at the end of 2017.

An ECB that tapers because growth and inflation are improving would not be a bad thing for markets. Frankly for some parts of the market, notably banks, anything which gets the ECB away from its current policy stance back towards normality is a positive. Indeed, the prospect of negative interest rates being reversed is the kind of thing which Alastair Ryan (our banks strategist) lies awake at night dreaming of (see European Banks Strategy: repressed).

But and it is a big but, if the ECB chooses to taper because it is running out of options or the ability to do QE that is not a good thing. Some of the hawks on the ECB would choose to taper at the first opportunity because they never really liked the idea of QE in the first place. A tapering at next week's meeting even if it is couched in terms of doing less for longer would not be good news for equity markets.

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Rotation – more to go but it has to be more gradual

On the basis of our central forecasts for growth, inflation and rates and given the moves in the market already we think that the pace of the rotation has to moderate. After all if we are to see another 30-40 bp of yield increase in the US between now and H2 2017 having already seen more than 90bp since the summer, it has to slow.

That view combined with the readings from our models lay behind our recent downgrades of banks and miners. That is not to say that the rotation is finished. If bond yields truly have turned than some of the more expensive defensives likely have to de-rate further. The bull market in those stocks has simply lasted too long for that not to be the case.

In addition while there have been significant moves in positioning in terms of cutting underweights in areas like Banks and Basic Resources and hedge fund positioning has probably moved faster still, we do not believe that positioning has completely turned around. Looking at both the Fund Manager Survey and our own internal data we think there are still legacy underweights in cyclical areas and legacy overweights in defensives, particularly quality defensives. That argues for another leg in the rotation trade.

Nevertheless, it suggests to us that a more balanced approach is justified right now. We are still overweight oil, but little else in the cyclical space, so today we add Media. We are still underweight Food & Beverage but against that we are overweight Healthcare and Utilities.

Relief or revolt – Eurozone politics in focus in 2017

We think it likely investors will demand a higher risk premium until the French Elections in May 2017 given the likelihood that Marine Le Pen will make to the second round of voting (according to polls). A Le Pen victory could likely bring the future of the EU and the Euro into question as she has talked about France withdrawing from both. That in turn has arguably the potential to be even more of an earthquake for the world's financial markets. Our central case is that centre right President is elected in France (with Francois Fillon now the official Republican candidate) and Merkel is returned at the head of a coalition government in Germany now that she has indicated she will stand for re-election. Until the French vote though we suspect investors will be cautious about European markets. Were this to be the case then we think there may well be room for a significant relief rally in European assets. We have more on this, including a calendar, in our section on Eurozone politics.

Decent valuations but not compelling

Headline PE multiples do not screen as particularly cheap for European equities but are also not excessively expensive. In fact the current forward PE on MSCI Europe at 14.1x is right in-line with the average since 1987. The most recent high in PE multiples was over 16.5x at the April 2015 market highs. However, more recently the market has traded in a fairly tight range around 14-15.5x PE, with some fleeting falls to 13x around the market lows in February 2016 and at the time of the Brexit referendum. At the current multiple we see valuations as quite reasonable therefore. Our index target assumes some multiple expansion back to 15x, which we think is quite achievable under our base case assumptions.

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Chart 17: MSCI Europe forward PE in-line with 30-year average at 14.1x...

Source: BofA Merrill Lynch Global Research, Datastream, IBES

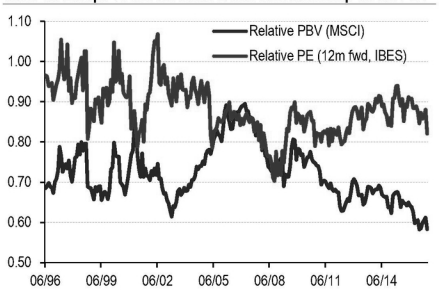
Chart 18: ...but at lower end of 13-15.5x PE range of last 15 months

Source: BofA Merrill Lynch Global Research, Datastream, IBES

Relative attractiveness of Europe depends on EPS recovery in medium-term. Moving to relative valuations, European equities screen somewhat cheap vs their DM peers. However, the medium-term bull case for Europe is far more a function of potential earnings and ROE recovery rather than significant undervaluation. Europe's valuation discount to the US is at multi decade wides on PBV (over 40%) but that in turn reflects Europe's significant underperformance on EPS growth and ROE. Trailing ROE for MSCI Europe is just 8% (at historical trough levels). That is nearly 5pp below MSCI USA compared to a 3pp gap on average historically and close to the widest spreads since the mid-1990s.

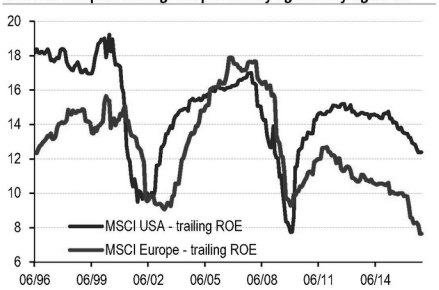
Europe vs US relative PE 7% below average. Based on PE, Europe nevertheless trades cheap relative to the US. The PE discount at 18% is 7% wider than the 20 year average and relative PE is at the lowest level since 2012. So while a sustained reversal in the underperformance of Europe versus the US would over time have to be driven by a recovery in relative profitability we do see current valuations reflecting a discount perhaps for political reasons (Brexit, upcoming elections).

Chart 19: Europe vs US: modest PE discount but cheap on rel. PBV



Source: BofA Merrill Lynch Global Research, Datastream, MSCI, IBES

Chart 20: European earnings and profitability significantly lag the US



Source: BofA Merrill Lynch Global Research, Datastream, MSCI

The other metric that illustrates the valuation overhang in Europe is the risk premium. Our model calculates an implied cost of equity (CoE) for Europe as 6.8%, a little below the average since 1988 (7.2%) and last 10 years (8.4%). The model assumes the cost of equity is simply the cyclically adjusted earnings yield (calculated using a 5 year centred average EPS). We then compare this number to the German bund yield to estimate the implied equity risk premium (ERP).

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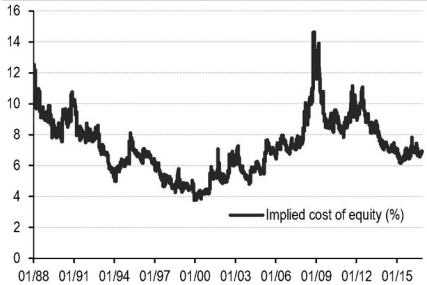
Europe's ERP on our model is 6.9% – down from the post-Brexit highs at 7.5% but still at a 70bp premium to the 3 and 5 year average for the ERP. That in turn implies a ~11% valuation haircut relative to 5-year average levels.

These numbers also show that the recent rise in bond yields is modest relative to where cost of equity or ERP sits. We're quite far away from the level that bond yields would make ERP look expensive. Even with bund yields at 75bp (ie +50bp from here) it would only shift the ERP back to average levels (all else equal). Bond yields need to rise 150-200bp to get to the expensive end of the range of last 6 years on ERP.

Chart 21: Implied cost of equity (CoE) on our model in Europe is 6.9%, a little below the average since 1988 (7.2%) and last 10 years (8.4%).



Source: BofA Merrill Lynch Global Research, Datastream, MSCI, IBES

Chart 22: Implied equity risk premium remains elevated: 6.7% ERP to bund yields vs 10-year average of 6.2% and recent high of 7.3%.

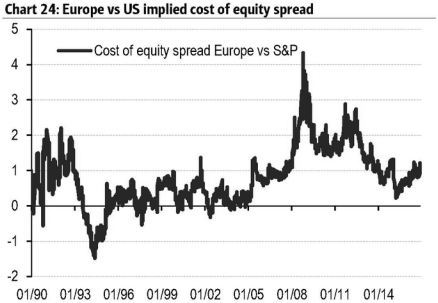
Source: BofA Merrill Lynch Global Research, Datastream, MSCI, IBES

Europe cost of equity higher than long-run average compared to US. Europe also compares favourably on a relative basis against the US equity market in this framework. The implied CoE for the S&P500 on an equivalent model is 5.64%, which is now at an 11-year low and 130bp below the 10-year average. The implied ERP on that basis at 3.3% is also below average and not far off the lows from the past 10 years. Admittedly Europe did get significantly cheaper relative to the US during the GFC and the sovereign debt crisis. The cost of equity premium for MSCI Europe vs the S&P is 1.21%. That is a premium to the 30-year average of 0.72%. However it is below the average of the past 10 years – the spread peaked at over 4% in 2008 and at 2.7% in 2011 / 2012.

Chart 23: Implied equity risk premium near 9-year lows in the US

Source: BofA Merrill Lynch Global Research, Datastream, MSCI, IBES

Chart 24: Europe vs US implied cost of equity spread



Source: BofA Merrill Lynch Global Research, Datastream, MSCI, IBES

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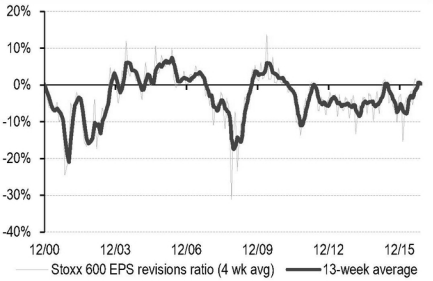
Earnings – a return to positive EPS growth in 2017

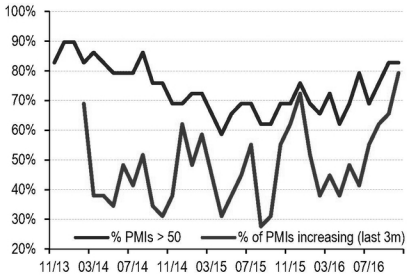
7% EPS growth in 2017 as global growth improves and Resources EPS recovers
We think the earnings backdrop will be supportive in 2017 with a return to positive EPS growth in Europe for the first time since 2014 and with downside to consensus forecasts for the year ahead that are well below average. Our base case assumes +7% EPS growth in 2017 and 2018. With EPS broadly stagnant over the last 6 years, investors might justifiably ask what is different this time. We see several reasons to think mid to high single digit EPS growth is achievable next year.

Chart 25: Earnings revisions are currently modestly positive



Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 26: Broad based recovery in global growth (based on 29 PMIs)



Source: BofA Merrill Lynch Global Research, Markit, Bloomberg

Return to positive EPS growth feasible with global GDP at 3.5%... First, global growth is accelerating and on our economists' base case forecasts global GDP growth will be 3.5%, the first materially above trend growth year since 2010. That is significant for European earnings given a reasonably tight relationship to global GDP growth. 3% represents the tipping point around which earnings growth tends to turn positive according to our regression model. At the BofAML forecast of 3.5% global GDP growth, 7% EPS growth is implied as likely by the same model.

...as leading indicators point to a synchronized global recovery. What gives us confidence in this putative earnings recovery is the more synchronized nature of the current recovery. All major regions of the world are showing momentum in growth indicators for the first time in several years. One measure of the broad nature of the improvement is manufacturing PMI surveys. Of 29 Markit PMIs 83% are currently above 50, highest since August 2014. More importantly, 79% have improved over the last 3 months – higher than at any point in the last three years.

Bull case of global GDP towards 4% would signal double digit EPS growth. To see a more bullish outcome for EPS we would need to see global GDP accelerating further. Based on our regression model, double digit EPS growth historically was consistent with global GDP growth above 3.8%. Under our bull case scenario for 2017, with say 4.0% global GDP growth, consensus EPS growth forecasts for +14% in Europe would become realistic.

PMIs beyond 55 would suggest upside to base case. Significant further gains in leading indicators would be a signal that earnings growth could exceed our base case. Over the longer term EPS growth has followed manufacturing PMI surveys with a 9-month lag approximately (using an average of US and Eurozone). Historically readings above 55 were consistent with mid-teens EPS growth. The relationship has weakened in recent years as low interest rates and weaker commodity prices weighed on earnings in Financials and Resources. Nevertheless, in the last year of decent EPS growth in Europe in 2014 the PMIs peaked at 54 so we would look for upside to our base case EPS forecast should PMIs improve to the mid-50s level or beyond.

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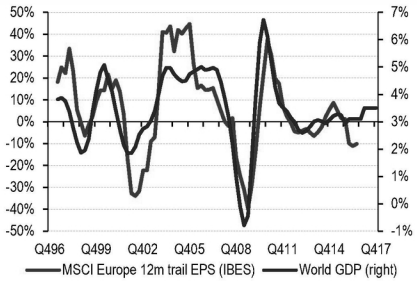
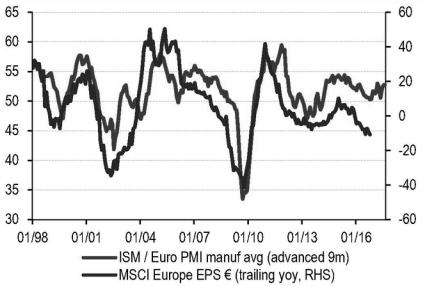
Chart 27: 3% Global GDP growth the tipping point for EPS
Europe trailing EPS growth vs World GDP



Source: BofA Merrill Lynch Global Research, Datastream, IBES

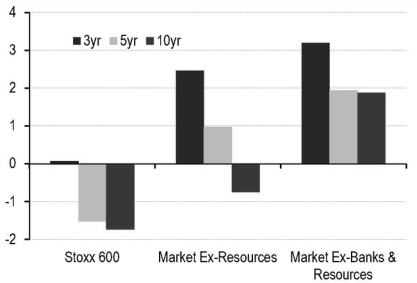
Chart 28: Synchronised rise in leading indicators globally augurs well for earnings recovery – especially if PMIs kick on to or above mid-50s



Source: BofA Merrill Lynch Global Research, Datastream, IBES

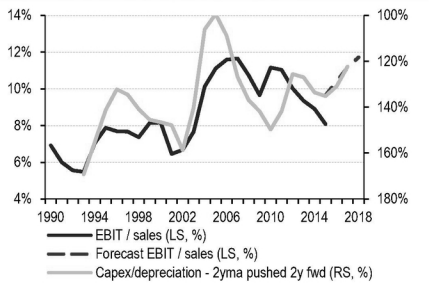
Removal of the 3pp p.a. drag from Resources supports EPS outlook. Second, the Resources sectors in 2017 will likely provide a (strongly) positive contribution to market EPS, in turn reversing what has been the biggest headwind for several years. Over the last 3-5 years the Resources sectors provided a 2.5 percentage point drag on annualized market EPS growth. In 2016 Banks have been the other big drag on market earnings. While structural headwinds to profitability mean the contribution of Banks remains open to debate, consensus forecasts nevertheless imply a strong recovery in 2017 (driven in part by one-offs reversing). The important point is that the market ex-Banks and Resources has delivered modest but positive EPS growth – estimated at +5.5% for 2016. Hence, removing the drag from Oil and Mining makes high single digit growth achievable in our view.

Chart 29: Resources a 2.5pp drag on market EPS growth in recent years
Annualized EPS growth



Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 30: Capex discipline supportive to margin outlook
Europe Ex-Financials: EBIT margins vs capex/depreciation



Source: BofA Merrill Lynch Global Research, Factset

Margin upside, capex discipline and FX tailwind provide additional support. Third, profit margins in Europe are not elevated: in the bottom third of the historical range (since 2004) at the EBITDA level and about average at the net level. With some acceleration in the top-line as global growth and inflation pick up, there is scope for margins to improve. In addition, several years of relative capex discipline provide potential support for margin improvement over the next 1-2 years in corporate Europe. Over the longer term, we find that operating margins have tended to improve with a lag of one to two years, following a period of declining capex ratios. That is encouraging for

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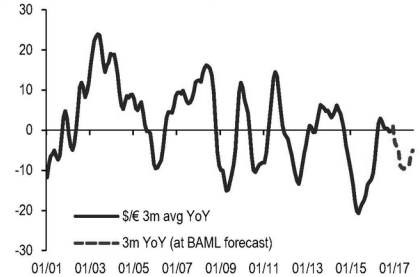
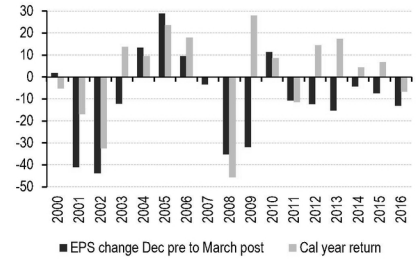
the margin outlook into 2017-18, given Capex to depreciation for the Market Ex-Financials in 2015 hit its lowest level since 2003 and had been declining for 3-years. Finally, we note that FX may provide a modest tailwind to European EPS again in 2017. Our FX team's $/€ forecasts trough at $1.02 in mid-2017, implying a rate of depreciation for the euro that peaks at 10%.

Chart 31: Stronger dollar would be a tailwind for EPS
YoY change in $/€ actual and implied by BofAML FX forecasts



Source: BofA Merrill Lynch Global Research, Datastream

Chart 32: Change in consensus EPS (%) vs annual market returns: downgrades are the norm and average -10%



Source: BofA Merrill Lynch Global Research, Datastream, IBES

Consensus downgrades in our base case – but less than average

Our base case 7% EPS growth assumption is below the current bottom up consensus of +14%. Hence, for now we don't see the prospect of a sustained upgrade cycle. Consensus downgrades are the norm however. 2010 was the last year that consensus forecasts started the year too low. In fact, consensus was too high in 12 of the last 17 years. Moreover, our estimate of 7% EPS growth in 2017 implies less downgrades than usual (10% is the average). It's also worth noting that over the past 17 years annual consensus downgrades of less than 10% have never been accompanied by negative equity returns for the same calendar year.

Sector EPS growth prospects

Correlation analysis of sector earnings growth against global GDP suggests that Banks are the sector that may be most sensitive to improvements in global economy. Interest rate developments are likely the key to earnings but they in turn should reflect the nominal growth environment. Real economic growth would also have some effect on credit volumes and collateral valuations though, reinforcing the link from the economy to Bank earnings.

Cyclicals unsurprisingly dominate the other sectors with EPS growth geared to global growth. Basic Resources, Chemicals, Tech and Industrials all exhibit a correlation above 70%. Some other cyclicals including Autos and Construction have been had much less correlated EPS growth to global GDP in recent years. In part that reflects that significant earnings volatility in the period analysed. What's notable for both groups is that expectations already look high for both sectors. Consensus estimates also factor in a rebound in Resources sector EPS growth – but both these sectors have seen the largest earnings declines over the past five years. Forecasts look more restrained in Industrials, Chemicals, Tech – implying mid to high single digit growth in the coming three years.

Among Defensives expectations look highest in Telecoms – suggesting 10% average EPS growth in 2016-18 despite the weak trend rate for sector earnings in recent years. Consensus forecasts imply a more modest improvement for Utilities – with just 1% EPS CAGR for 2016-18. Staples and Healthcare are forecast to have high single digit EPS growth in the coming 3 years, implying 2-3pp improvements in the annual growth rate relative the trailing 5-year average for Staples and +6pp for Healthcare.

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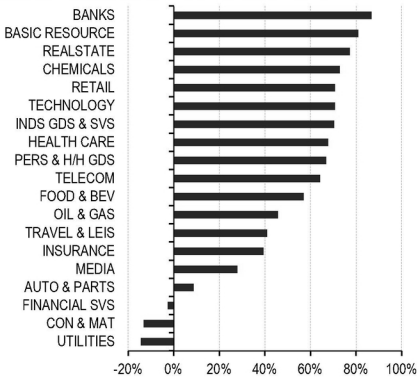
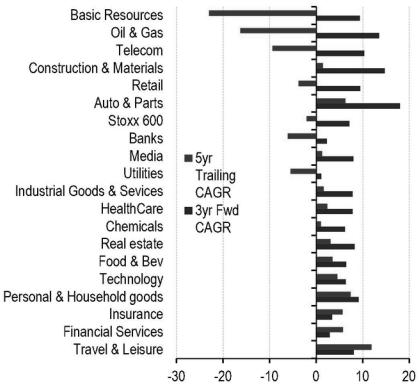
Chart 33: Correlation of sector EPS to global GDP since 2010



Source: BofA Merrill Lynch Global Research, Datastream, IBES

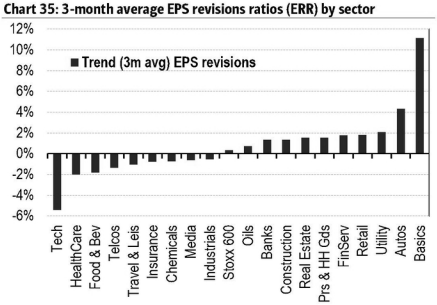
Chart 34: Trailing vs forward EPS CAGR – ranked by difference



Source: BofA Merrill Lynch Global Research, Datastream, IBES

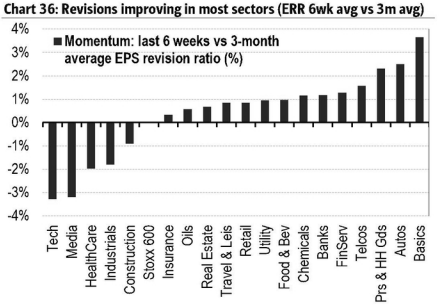
Earnings revisions trends. Basic Resources show strongest revisions trends and revisions are still improving relative to trend, in light of the strong upside recently for many metals prices. Autos revisions are next strongest and also show some positive momentum. More broadly most sectors are not showing an improvement in the trend on earnings revisions. Revisions are weakest in Tech having deteriorated more than other sectors over the past six weeks. The improvement in Financials revisions continues and Banks and Financial Services are now in positive territory.

Chart 35: 3-month average EPS revisions ratios (ERR) by sector



Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 36: Revisions improving in most sectors (ERR 6wk avg vs 3m avg)



Source: BofA Merrill Lynch Global Research, Datastream, IBES

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Eurozone political calendar 2017

4 December: Italian constitutional referendum
Our base case is a close "No" vote where Renzi stays and no snap election, given current polls and the outstanding electoral reform court case. BTPs and the banks recaps remain a tail risks for the Italian economy, although the ECB extending QE should help. A big "No" vote would boost Five Star and undermine Renzi into 2018 elections, in our view.

4 December: Austrian presidential election
Polls by public broadcaster ORF show the result as very close. Norbert Hofer is standing on an anti-immigrant platform against the moderate former Green leader Alexander Van der Bellen in a rerun of the May vote. The election of Freedom party candidate Norbert Hofer would make Austria the first nation to elect a head of state running on a far right platform since the EU began.

22/ 29 Jan: French Socialist Party presidential nominee elections
If President François Hollande decides to run for re-election as the Socialist Party candidate (decision expected Dec 10th) he could be challenged by former Prime Minister Manuel Valls and Economy Minister Arnaud Montebourg. Current second round polls for any combination of these candidates suggest likely Socialist nominee too close to call.

15 March 2017: Dutch elections
Prime Minister Mark Rutte currently leads a "purple" coalition with the Dutch Labour party as main second party. But the latest polls suggest both parties could win fewer seats than they have now in 2017. That could make it more challenging to build a government given the need to secure at least 76/150 seats. In terms of who could lead that coalition, polls have Rutte's People's Party neck and neck with the anti-immigrant Freedom party led by populist Geert Wilders. Wilders has called for the Netherlands to leave the EU indicated he would call a referendum if elected. A Wilder-Rutte coalition also hasn't been ruled out according to press reports.

23 April: French first round presidential elections
The first round of voting for the next French president will be on 23 April. First round polling suggests the leader of the anti-EU Front National Marine Le Pen is expected to progress to the decisive runoff. At present Republican Candidate Francois Fillon is also expected to make it through.

7 May 2017: French second round presidential elections
Current polls, albeit their validity has been called into question by events in 2016, show Fillon securing 65-70% of the vote vs Le Pen in a runoff (see chart below). We note that when her father, Jean-Marie Le Pen, faced Jacques Chirac in the 2002 Presidential elections the FN candidate only received 18% of the vote. Nevertheless, we see a potential Le Pen win as the biggest political risk event for European (and possibly global) equity markets in 2017.

By 22 October 2017: German Federal elections
Current Chancellor Angela Merkel has announced that she intends to stand for re-election. Current polls have Merkel's CDU ahead followed by SDP with the euro-sceptic Alternative für Deutschland, Greens and Die Linke competing for third spot. While it may be necessary for Merkel to maintain the grand coalition with the SDP, our central case is that we see a continuation of the current German administration and that German elections carry less risk than the earlier French presidential elections.

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Politics – populism in the Eurozone?

Few predicted that the UK would vote to leave the EU and Donald Trump would win the US presidential election in 2016, least of all pollsters (and many in markets). As Michael Hartnett argues, the rise of populism can be linked to what he refers to as Peak Inequality and Peak Globalisation. Trump and the Brexit campaign tapped into deep apathy with the socio-economic order that for them remains unreformed post-GFC. That's why the poster boy for this dislocation is often the blue collar voter whose standards of living have not been rising in the increasingly globalised world. The crucial question for investors as we enter a busy year for European politics (see table opposite) is whether the populism train will gather pace or terminate at the Eurozone.

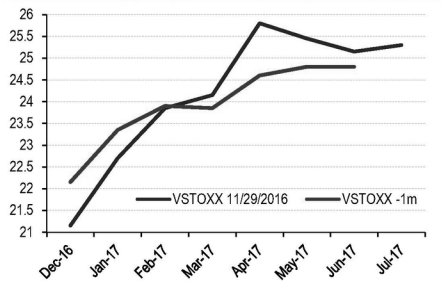
Italy risks elevated, but risks two way and banks the bigger issue

Although Italy goes to the polls this year, it is worthwhile starting with this Sunday's vote. In Strategy Insights: Italy risks elevated we argue that our base case is a narrow rejection of the proposed constitutional reform, which is another vote against governing party on Dec 4. But unlike UK/ US, this would be expected and Renzi is likely to stay on so the outcome should not carry the same surprise or uncertainty factor for markets. The tail risk are also two way. A large "No" vote could perceived as supportive of the 5 star movement but a "Yes" vote would be bullish Italy and risk assets more generally. The bigger issue is likely recapitalisation of the Italian banks. This remains a significant tail risk for banks and was part of why we downgraded the sector.

A Le Pen victory could prove the biggest risk to European markets in 2017

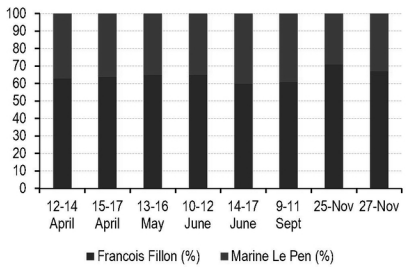
Probably the most natural fit for the populism theme in 2017 is the French presidential election. Although polls have been somewhat discredited by events this year they remain useful as an indication of where the public mood lies. With that caveat in mind, current voting intentions suggests Front National leader Marine Le Pen will receive enough votes to progress to the second round and is likely to be joined by Republican candidate Francois Fillon. Although when Fillon and Le Pen are polled together in a second round runoff Fillon is ahead by ~65%-35%, Le Pen is seen as capable of appealing to the same anti-establishment / blue collar voters as Trump/ Brexit.

Chart 37: Vol already picking up around the French primaries next year



Source: Bloomberg

Chart 38: Yet Fillon still well ahead of Le Pen in polls of a potential run-off



Source: Ifop (12-14 Apr, 14-17 Jun), BVA (15-17 Apr, 13-16 Mar, 10-12 Jun, 9-11 Sept), Odoxa (25 Nov), Harris Interactive (27 Nov). Note: all 2016.

Investors' biggest concerns are that we could see the same narrowing of polls in favour of Le Pen into the election months as we saw in the UK/US. We think this could mean French political risk becomes a major overhang for European equities in H1 2017. The worry is that a Le Pen Presidency could bring the future of the EU and the Euro into question as she has talked about France withdrawing from both and is especially an issue because of the winner takes it all nature of French presidential elections. As James

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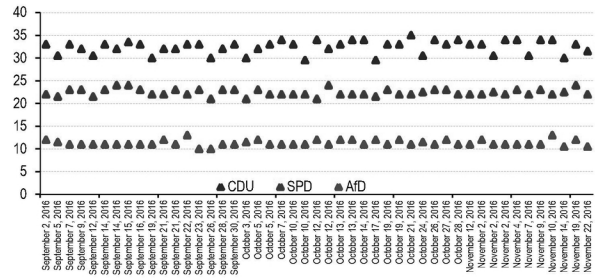
Barty argued in The Trump Inflection, Le Pen's victory has the potential to be even more of an earthquake for the world's financial markets. Indeed, we have already seen a 1vol move in April 2017 V2X futures since last month.

So our central case is French political risk caps markets to the upside for Q1 and most of Q2 but that the centre right candidate Fillon is elected President. As Gilles Moec argues, his pro-market reformist agenda could unlock French growth and we think it could prove a significant positive catalyst for European equities more broadly if the political risk premium is priced out against a solid European and global growth backdrop.

More of the same expected in Germany

We think Germany carries less political risk than the French election now that Merkel has formally announced she will run again to be Chancellor. As a result, our central case is that Merkel will continue to head a coalition government. We could see the populist AfD win more votes than in 2012, but polls show a clear and decisive margin in favour of the CDU and the existing coalition with the SDP suggests that an extension of their partnership is the most likely eventuality.

Chart 39: German polls show a consistent lead for Merkel's CDU party



Source: Allensbach (15-Sept, 13-Oct), Emnid (7-Sept, 14-Sept, 21-Sept, 28-Sept, 5-Oct, 12-Oct, 19-Oct, 26-Oct, 2-Nov, 9-Nov, 19-Nov), Forsa (2-Sept, 9-Sept, 16-Sept, 23-Sept, 30-Sept, 7-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov), Forschungsgruppe Wahlen (22-Sept, 13-Oct, 27-Oct, 10-Nov), GMS (14-Sept, 12-Oct, 12-Nov), Infratest dimap (21-Sept, 5-Oct, 19-Oct, 2-Nov), INSA (5-Sept, 12-Sept, 19-Sept, 26-Sept, 3-Oct, 10-Oct, 17-Oct, 24-Oct, 2-Nov, 7-Nov, 14-Nov, 22-Nov), Ipsos (10-Oct)

Brexit was the big political topic for Europe going into 2016. Going forward we see it as an ongoing issue but mostly for the UK (see UK – Waiting for Brexit for more details).

Rising bond yields & equities

With the market focus on the sharp bond market sell-off it is worth re-visiting the links between equities and bonds as many investors question whether the effect on equities will become negative the more yields rise. An environment of rising bond yields is not inherently problematic. Over time correlations between bond yields and equities have varied and on average have been very weak (if slightly positive) over the last twenty years. Typically when rising yields reflect improving growth conditions and or rising risk appetite equities have naturally benefitted. Certainly since 2010 for the most part higher yields were accompanied by higher equity prices.

Track record mixed for stocks following bond yield spike. Does an exceptionally sharp back up in bond yields represent a downside risk for equities? The historical evidence is inconclusive. We looked at equity market returns in the months following 2.5SD moves in German bond yields (based on a comparison of rolling 3-month yield changes to the 52-week average). The recent spike in German yields peaked at +2.9SD on the same basis. We found 11 comparable episodes since 1980. Equity market returns subsequent to the peak rate of change in bunds were moderately positive – a median

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